ORDER NO. AD8805083C9

Service Manual

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-PJ45

Color

(K)...Black Type

Area

Color	Area
(K)	(E).....Continental Europe.
(K)	(EK).....United Kigndom.
(K)	(XL).....Australia.
(K)	(EG).....F.R. Germany.
(K)	(EB).....Belgium.
(K)	(EH).....Holland.
(K)	(EF).....France.
(K)	(EI).....Italy.
(K)	(XA).....Asia, Latin America, Middle Near East, Africa and Oceania.
(K)	(XB).....Saudi Arabia.
(K)	(PC).....European Audio Club.

SPECIFICATIONS

■ Audio

No. of channels	2 (left and right stereo)
Frequency response	2~20,000Hz±0.5dB
Output voltage	2V (at 0dB)
Dynamic range	94dB
S/N ratio	96dB
Harmonic distortion	0.003% (1kHz, 0dB)
Total harmonic distortion	0.006% (1kHz, 0dB)
Wow and flutter	Below measurable limit
Output impedance	Approx. 600Ω
Load impedance	More than 10kΩ
Headphone output level	15mW, 32Ω
D-A conversion system	2 DAC System with 16-bit Resolution

■ Signal Format

Sampling frequency	44.1kHz
D-A conversion	16-bit linear

■ Pickup

Wavelength	780nm

■ Infrared remote-control transmitter

Dimensions (W × H × D)	61 × 18 × 165mm
Batteries	UM-4 "AAA" batteries or IEC R03 or equivalent (1.5V × 2)
Weight	100g (including batteries)

■ General

Power supply

For United Kingdom and Australia: AC 240V, 50/60Hz

For Continental Europe: AC 220V, 50/60Hz

For Others: AC 110V/127V/220V/240V, 50/60Hz

Power consumption	16W
Dimensions (W × H × D)	360 × 90 × 270mm
Weight	3.6kg

Specifications are subject to change without notice.
Weight and dimensions shown are approximate.

Technics

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

Panasonic Tokyo Office
Matsushita Electric Industrial Co., Ltd.
6th Floor, World Trade Center Bldg.,
No. 4-1,Hamamatsu-cho 2-Chome,Minato-ku,
Tokyo 105,Japan

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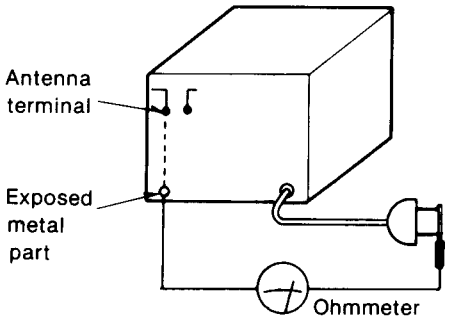
■ SAFETY PRECAUTION (This "safety precautions" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

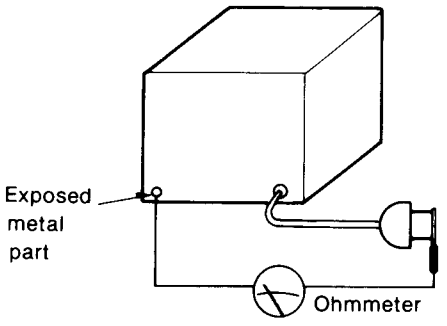
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



(Fig. B)

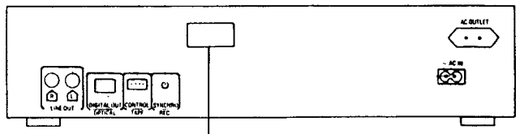
Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

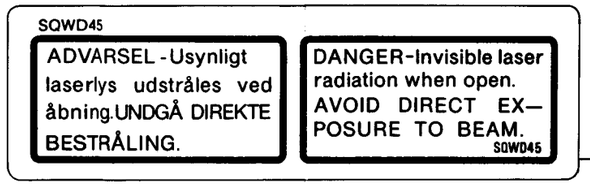
D

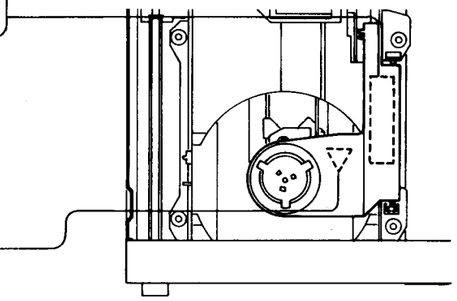
■ PRECAUTION OF LASER DIODE

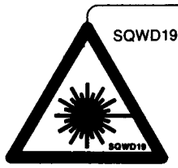
Caution: This product utilizes a laser diode.
ADVARSEL: I dette a apparat anvendes laser.



Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.


SQWD45
ADVARSEL - Usynligt laserlys udstråles ved åbning. UNDGÅ DIREKTE BESTRÅLING.
DANGER-Invisible laser radiation when open. AVOID DIRECT EX-POSURE TO BEAM.
SQWD45



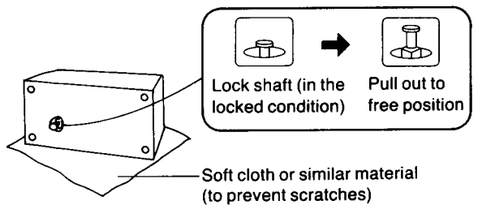


VAROITUS! Laite sisältää laserdiodin,
joka lähettää näkymätöntä silmille
vaarallista lasersäteilya

■ BEFORE USING THIS UNIT

Before placement

The optical pick-up is secured to prevent damage during transport. Be sure to release it before use.



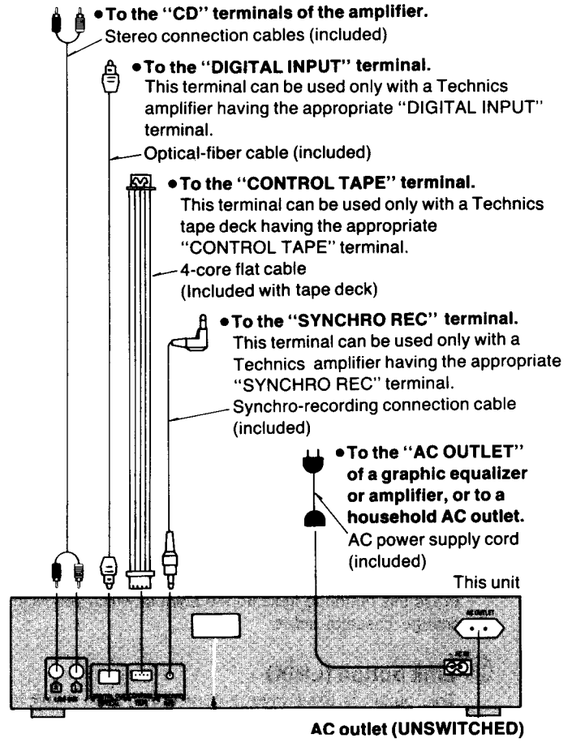
Caution:
Do not transport the unit without locking the lock shaft.
Severe damage will result.
If the unit is transported again, perform the following steps:
1) Remove the disc from the tray and turn off the power.
2) Place the unit with **the rear panel facing downward.**
3) Push the lock shaft to the in (LOCK) position (▟→▄).

Notes for placement

■ **Place on a flat, level surface so that the front-rear inclination does not exceed 5°.**
■ **Avoid places such as the following:**
- Near any equipment or device that generates strong magnetism.
- On any heat-generating equipment or device, or in any place where the temperature is high (40°C or higher).
- Extremely cold places (5°C or below).
- Near a tuner or TV. (It may cause noise in the broadcast, or disturbance of the TV picture.)

■ **Do not place heavy objects, other than system components, on top of the unit.**
■ **When carrying or storing the unit, handle it with care so it is not subjected to any strong bumps.**
Always remove the disc before storing the unit for any period of time.
■ **To avoid problems due to vibration.**
- Do not place a book or similar object under this unit.
- Do not route the connection cables (of this or other units) across the operation panel, across the top, or under the unit.

■ CONNECTIONS


●To the "CD" terminals of the amplifier.
Stereo connection cables (included)
●To the "DIGITAL INPUT" terminal.
This terminal can be used only with a Technics amplifier having the appropriate "DIGITAL INPUT" terminal.
Optical-fiber cable (included)
●To the "CONTROL TAPE" terminal.
This terminal can be used only with a Technics tape deck having the appropriate "CONTROL TAPE" terminal.
4-core flat cable
(Included with tape deck)
●To the "SYNCHRO REC" terminal.
This terminal can be used only with a Technics amplifier having the appropriate "SYNCHRO REC" terminal.
Synchro-recording connection cable (included)
●To the "AC OUTLET" of a graphic equalizer or amplifier, or to a household AC outlet.
AC power supply cord (included)
This unit

AC outlet (UNSWITCHED)

Notes:
1. See the operating instructions of the amplifier for details.
2. The configuration of the AC outlet and AC power supply cord differs according to area.

AC outlet (UNSWITCHED):

Power is always available, regardless of the unit's power switch setting.
This outlet is exclusively for the connection of other audio equipment, such as an amplifier. Be sure the power consumption does not exceed the wattage specified near the AC outlet.

Digital output terminal (DIGITAL OUT)

The output signals of this unit are output from this terminal as digital signals.

●Optical terminal (OPTICAL)
This terminal can be used for connection with other equipment that has a digital input terminal, such as an amplifier, by using an optical-fiber cable (included).
A dust-protection cap is inserted in this terminal. Remove this cap only when a connection is to be made to this terminal.

CAUTION

When using the optical-fiber cable, please keep the following points in mind:
1. The maximum length of optical cable to be used with this unit is 3 m (approx. 10 ft.).

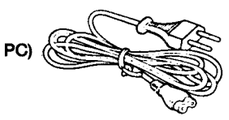
2. Always make sure the plug is fully inserted. If the plug is not inserted all the way, an imperfect connection will result.

3. The optical-fiber cable must never be bent or coiled tightly. Doing so will permanently damage the optical-fiber in the cable and, therefore, prevent proper data transmission. If the cable must be coiled (for storage, etc.), the diameter of the loop should be at least 15 cm (approx. 6 inches).

4. Handle the optical cable's plug very carefully. Keep the plug free from dust or damage. Dust can be removed by wiping the plug with a soft cloth. Do not use any cleaners or solvents to clean the plug.

■ ACCESSORIES

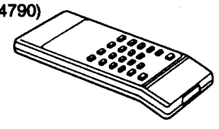
- AC power supply cord 1
  SFDAC05E03 (E, EB, EH, EG, EF, EI)
  SJA173 (XL)
  SJA188 (EK)
  SJA168 (XA, PC)
  SJA183 (XB)



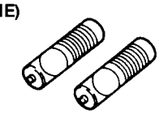
- Stereo connection cable 1
  (SJP2249-1)

- Optical-fiber cable 1
  (SJPD16)

- Remote-control transmitter 1
  (EUR64790)

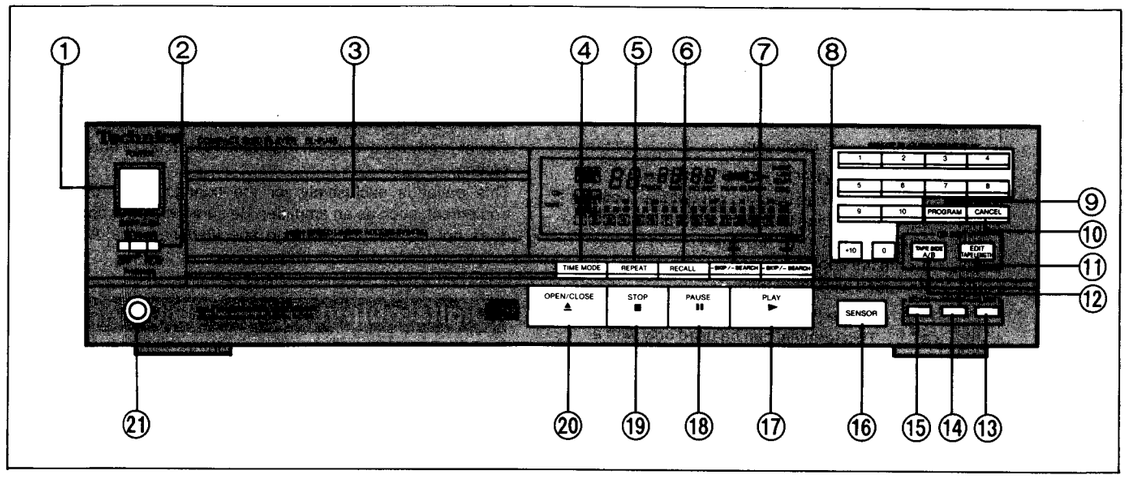


- Batteries 2
  (UM-4NE)



- Synchro-recording connection cable 1
  (SJP2257T)

■ FRONT PANEL CONTROLS AND FUNCTIONS



Control section

① Power switch (POWER)

② Timer stand-by switch (TIMER)

③ Disc tray

④ Time-mode select button (TIME MODE)
Use this button to select the desired time display mode.

⑤ Repeat button (REPEAT)

⑥ Recall button (RECALL)
Press this button to display the program play sequence in the memory.

⑦ Skip/search buttons (SKIP/SEARCH)

⑧ Numeric buttons (+10, 0, 1~10)
These buttons can be used to select the track numbers and the recording time.

⑨ Programmed-play button (PROGRAM)

⑩ Cancel button (CANCEL)
To cancel a track number from memory, first press the appropriate numeric button to display the number of the track you wish to cancel, then press this button.

⑪ Compact-disc edit button (EDIT/TAPE LENGTH)
This button is used when recording from a compact disc. When the button is pressed and the tape's length is specified, the tracks to be recorded will be automatically selected, and, at the same time, the peak level search will begin.

⑫ Tape-side select button (TAPE SIDE A/B)
Press this button to indicate the point at which you wish to change cassette sides.

⑬ Link button (LINK)
This button is used when edit-recordings are made from several compact discs.

⑭ Warp button (WARP)
This button is used to select (during edit recording from a compact disc) tracks of the appropriate length (from the tracks remaining on the compact disc) and to add those tracks to an as-yet unrecorded space on the cassette tape, and to replace tracks on the A side and B side of the tape with other tracks.

⑮ Music scan button (SCAN)
This button can be used to play the first part of each track in order.
This is convenient to find the title or the track number.

⑯ Remote-control signal receptor (SENSOR)

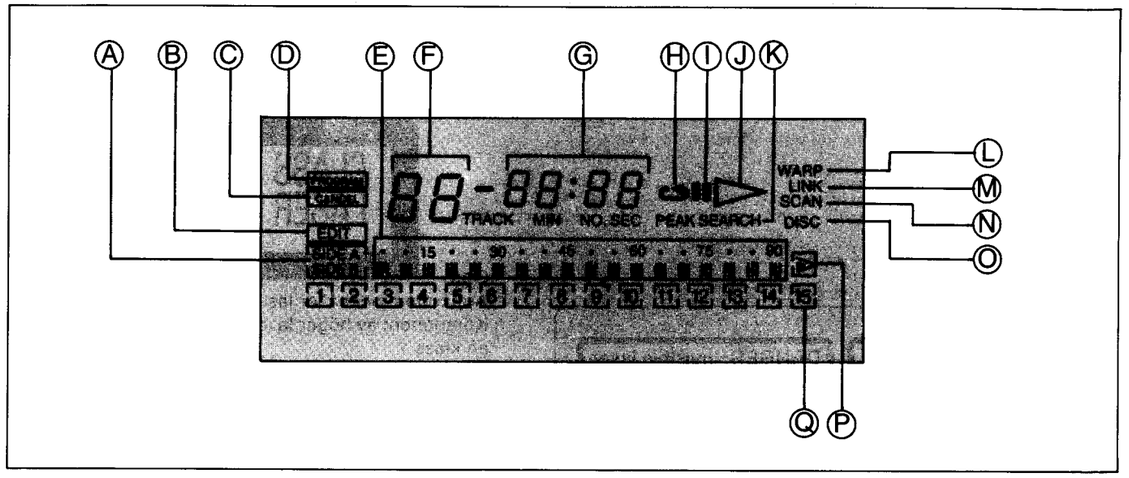
⑰ Play button (PLAY/▶)

⑱ Pause button (PAUSE/❚❚)

⑲ Stop button (STOP/■)
This button can be used to stop the disc play, as well as to cancel the various play modes.

⑳ Disc tray open/close button (OPEN/CLOSE/▲)

㉑ Headphones jack (PHONES)



Indicators section

Ⓐ Tape side indicator (SIDE A / SIDE B)
This bracket indicator illuminates to show which cassette side, "A" or "B", has been selected with the tape side (A/B) select button.

Ⓑ Edit indicator (EDIT)
Illuminates when the edit button is pressed and goes out when the stop button is pressed.

Ⓒ Cancel indicator (CANCEL)
This indicator illuminates when the cancel button is used; a programmed track can be canceled during the time that this indicator is illuminated.

Ⓓ Programmed-play indicator (PROGRAM)

Ⓔ Time scale
The compact disc's play time, and the tape length for an edit-recording, are displayed by bars (in units of 5 minutes each).
In addition, the play-position is indicated by continuous bar flashing.

Ⓕ Track number display (TRACK)

Ⓖ Time display (MIN/NO./SEC)

Ⓗ Repeat indicator (↻)

Ⓘ Pause indicator (❚❚)

Ⓙ Play indicator (▷)

Ⓚ Peak-level search indicator (PEAK SEARCH)

Ⓛ Warp indicator (WARP)

Ⓜ Link indicator (LINK)

Ⓝ Scan indicator (SCAN)

Ⓞ Disc indicator (DISC)
This indicator illuminates when a disc is loaded.

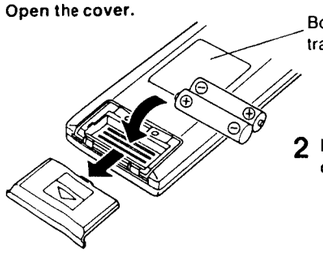
Ⓟ Over mark (▶)
The ▶ indicator illuminates if the total number of tracks on the disc is 16 tracks or more.
When the play reaches the 16th track and thereafter, the bracket indicator "⌐¬" begins flashing.

Ⓠ Music matrix (1 ~ 15)
The numbers of the tracks on the disc are displayed up to a maximum of 15.

■ REMOTE-CONTROL TRANSMITTER (EUR64790)

Insertion of remote-control transmitter batteries

1 Open the cover.



2 Insert the batteries and close the cover.

Use two AAA size [R03 (UM-4): 1.5 V] batteries.

■ To remove the batteries

Reverse procedure 2.

■ Battery life

About 1 year.
(Depending on frequency of use.)

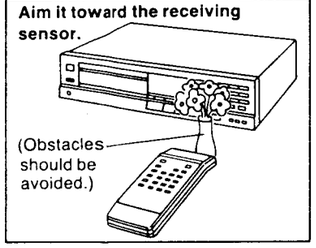
■ Notes concerning use of dry batteries

- Do not use chargeable batteries (Ni-Cd type).
- Be sure the batteries are inserted so that the positive (+) and negative (−) polarities are correct. Batteries installed with incorrect polarities may leak and damage the remote-control transmitter.
- Never subject the batteries to excessive heat or flame; do not attempt to disassemble them; and be sure they are not short-circuited.
- If the remote-control transmitter is not to be used for a long time, remove the batteries and store them in a cool dark place.
- Always remove old, weak or worn-out batteries promptly and dispose of them properly.
- Never mix old and new batteries, nor batteries of different types (carbon or alkaline).

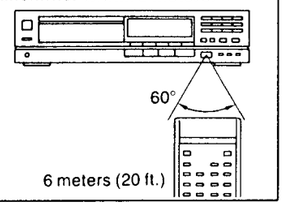
Operation notes

Note that operation may not be correct if direct sunlight or other strong light strikes the remote-control signal receptor part of this unit. If there is a problem, place the unit away from the direct sunlight or other strong light source.

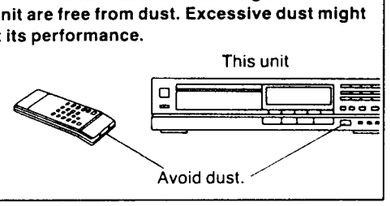
Aim it toward the receiving sensor.



Use the remote-control transmitter within 6 meters.

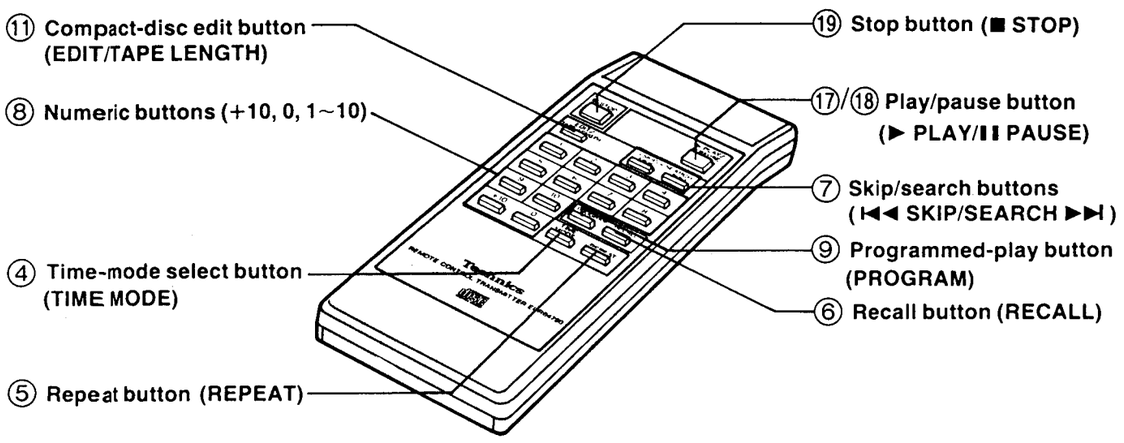


Be sure the transmitting window of the remote-control transmitter and the receiving sensor of this unit are free from dust. Excessive dust might affect its performance.



Note: The control panel of the remote-control transmitter may be covered by a clear plastic protective sheet. This sheet may be removed if desired.

Control names

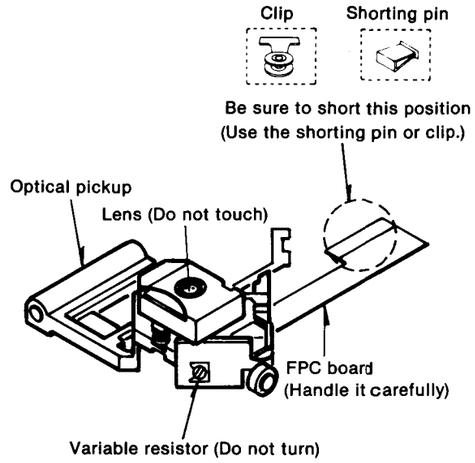

⑪ Compact-disc edit button (EDIT/TAPE LENGTH)
⑧ Numeric buttons (+10, 0, 1~10)
④ Time-mode select button (TIME MODE)
⑤ Repeat button (REPEAT)
⑲ Stop button (■ STOP)
⑰/⑱ Play/pause button (► PLAY/❚❚ PAUSE)
⑦ Skip/search buttons (I◄◄ SKIP/SEARCH ►►I)
⑨ Programmed-play button (PROGRAM)
⑥ Recall button (RECALL)

■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.

• Handling of optical pickup

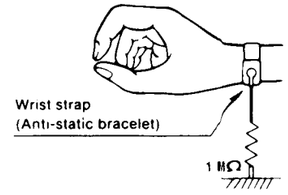
1. Do not give excessive shock to the optical pickup because it is of extremely precise structure.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. **(FPC board)**
   When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board. **(FPC board)**
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

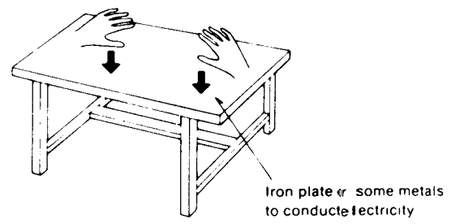


• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to relieve the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.



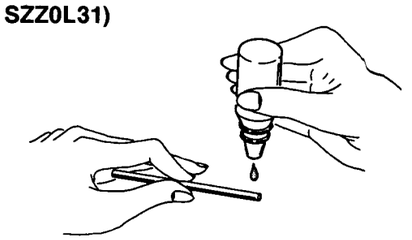


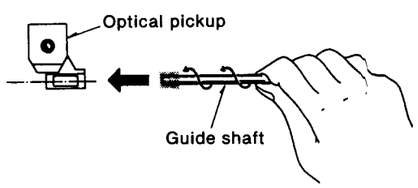
■ INSTRUCTIONS FOR THE OIL (Part No. SZZ0L31)

The container contains 6g (approx. 3ml) of oil. Since one application (one shaft) uses 0.05ml of oil.

How to Use

(1) Remove the guide shaft in the traverse deck from the optical pickup and clean off any dust from the guide shaft.
(2) Apply one drop of the SZZ0L31 to the tip of the guide shaft.
(3) Hold the guide shaft so that its oiled end touches the optical pickup and insert it into the bearing while rotating it slowly.
(4) After securing the guide shaft, move the optical pickup by hand several times to the left and right to distribute the oil on the guide shaft.

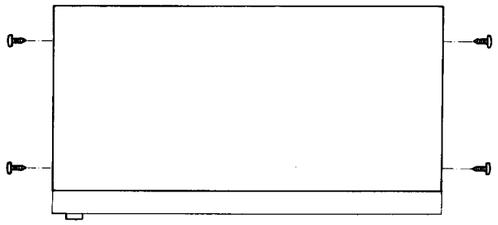




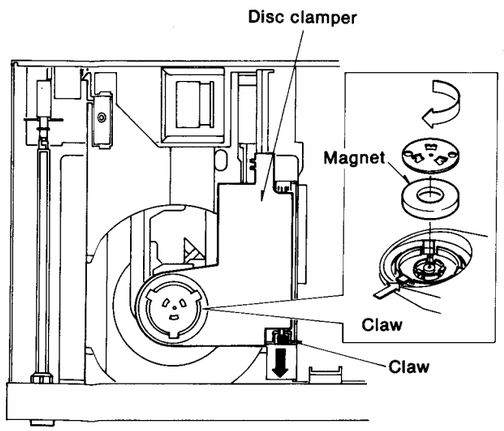
■ DISASSEMBLY INSTRUCTIONS

CAUTION:
- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.

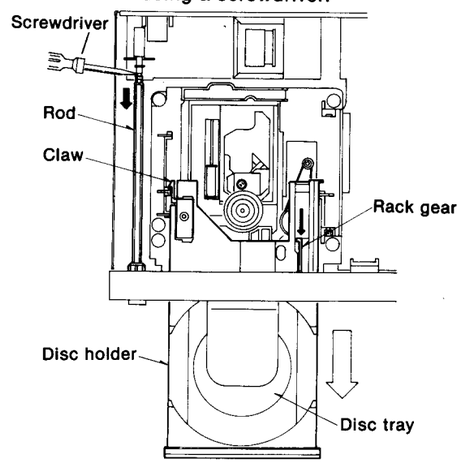
Ref. No. 1	How to remove the cabinet
Procedure 1	1. Remove the 4 screws.



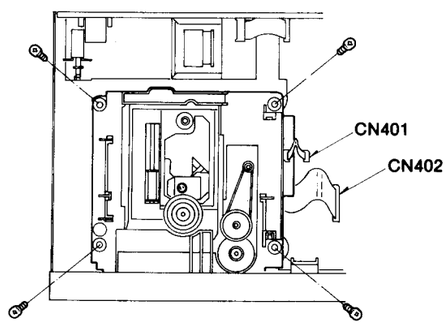
Ref. No. 2	How to remove the disc clamper and magnet
Procedure 1→2	**A. Disc clamper:** • Release the claw. • Lift clamper and pull in the direction of the arrow. **B. Magnet:** • Turn the holder in the direction of the arrow to release the claw.



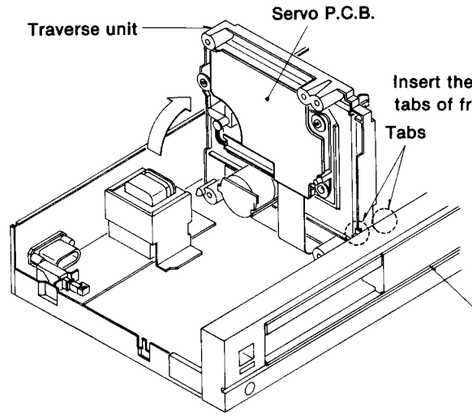
Ref. No. 3	How to remove the disc holder and power switch rod
Procedure 1→2→3	**A. Disc holder:** 1. Push the rack gear slowly in the direction of the arrow until the disc tray comes up. 2. Pull the disc holder until it stops. 3. Release the claw. 4. Pull out the disc holder further to remove it. **B. Power switch rod:** 1. Set the power switch in the "OFF" position. 2. Remove the power switch rod by using a screwdriver.



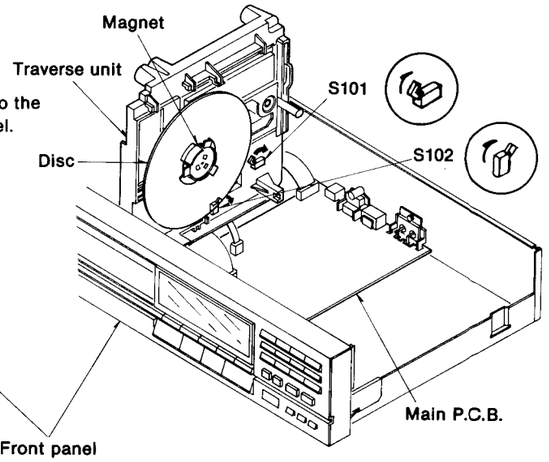
Ref. No. 4	How to remove the traverse unit
Procedure 1→2→3→4	• Remove the 4 screws.



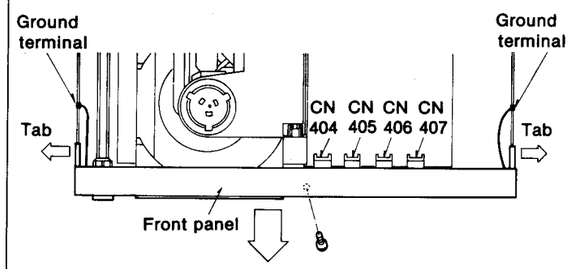
Ref. No. 5	How to check the servo P.C.B.
Procedure 1→2→3→4→5	• When checking the soldered surfaces of the servo P.C.B. and replacing the parts, do as shown.



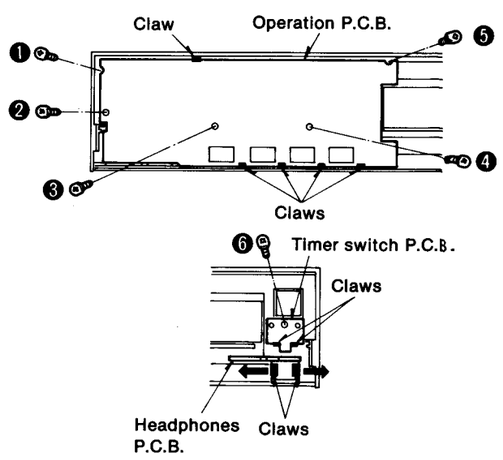
(To play a disc)
1. Place the test disc and magnet.
2. Turn "ON" the power switch of the player while holding the levers of the switches (S101, S102) in the direction of the arrow.



Ref. No. 6	How to remove the front panel
Procedure 1→6	• Remove the 1 screw. • Release the ground terminals. • Slightly pull out the tabs and remove the front panel in the direction of the arrow.



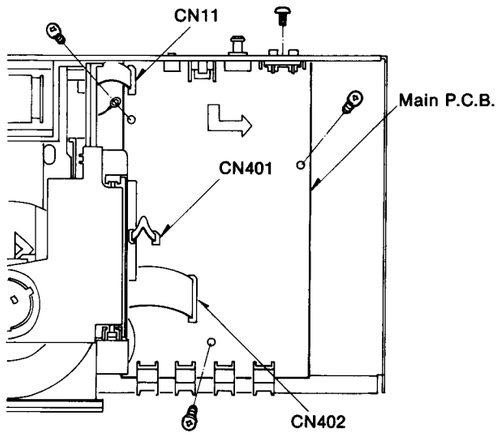
Ref. No. 7	How to remove the operation P.C.B., headphones P.C.B. and timer switch P.C.B.
Procedure 1→6→7	**A. Operation P.C.B.** 1. Remove the 5 screws (❶~❺). 2. Release the 5 claws. **B. Headphones P.C.B.** 1. Release the claws. **C. Timer switch P.C.B.** 1. Remove the 1 screw (❻). 2. Release the claws.



Ref. No. 8 — How to remove the main P.C.B.

Procedure 1→6→8

1. Remove the 4 screws.
2. Lift the P.C.B. remove it from the chassis tab.
3. Remove the P.C.B. in the direction of the arrow.

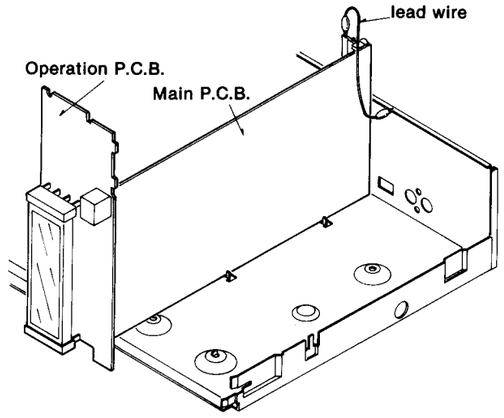


How to check the main P.C.B.

- When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown.

Cautions:

- Be sure to connect the P.C.B. ground terminal (line out terminal) and the chassis with a lead wire.
- Be sure to connect the GND lead wire from the loading base to the chassis.



Ref. No. 9 — How to remove the servo P.C.B. and loading motor P.C.B.

Procedure 1→2→3→4→9

A. Servo P.C.B.

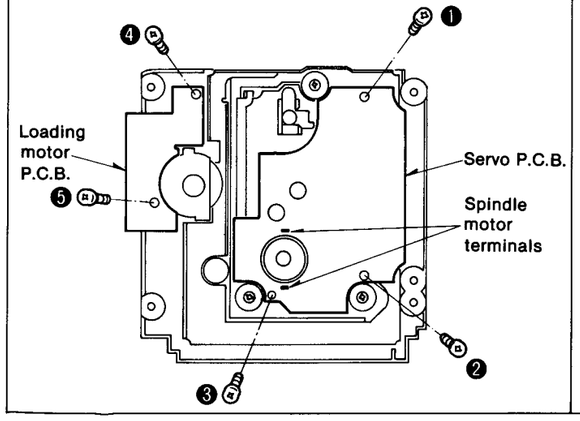
1. Remove the 3 screws (❶~❸).
2. Unsolder the 2 terminals of spindle motor.
3. Remove the FPC cord from the optical pickup.

Caution:

Be sure to short the FPC cord within 20 seconds after removal to prevent breakdown of the laser diode.

B. Loading motor P.C.B.

1. Remove the 2 screws (❹, ❺).

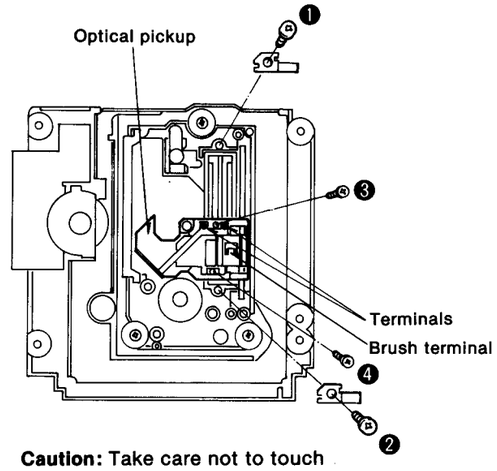


Ref. No. 10 — How to remove the optical pickup

Procedure 1→2→3→4→9→10

Refer to the optical pickup handling precautions and instructions for the oil (See page 8).

1. Remove the 2 screws (❶, ❷).
2. Unsolder the 2 terminals and the 2 screws (❸, ❹).

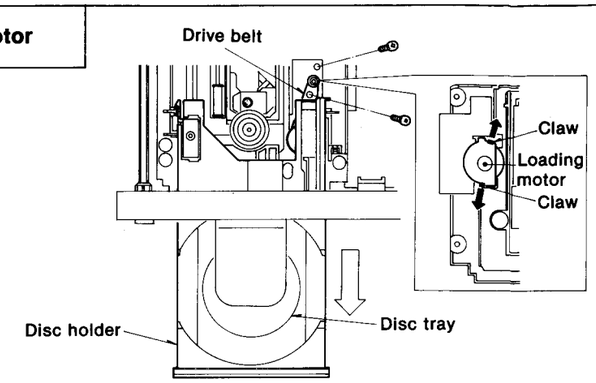


Caution: Take care not to touch the brush terminal.

Ref. No. 11 — How to remove the loading motor

Procedure 1→2→3→4→11

1. Remove the drive belt.
2. Remove the 2 screws.
3. Turn traverse unit over.
4. Release the claws.
5. Unsolder the terminals.



Ref. No. 12 — How to remove the spindle motor

Procedure 1→2→3→4→9→12

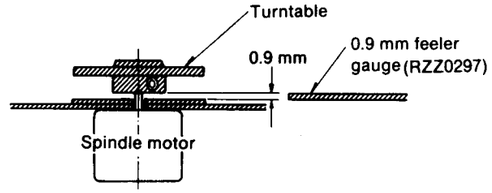
1. Loosen the screw (❶) by using a 1.27mm hexagonal wrench and remove the turntable.
2. Remove the 2 screws (❷, ❸).

Caution:

1. Turntable height adjustment is necessary any time the turntable or spindle motor is replaced.
2. The (+) terminal of the spindle motor is indicated by the red mark.

Adjustment of turntable height

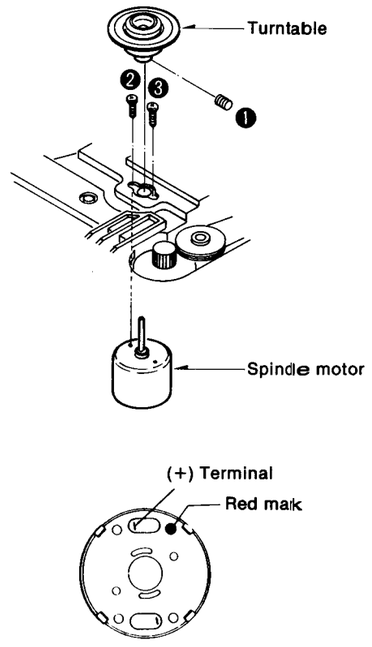
1. Insert a 0.9mm feeler gauge (RZZ0297) between the turntable and loading base as shown below.



2. Tighten the turntable set-screw by using a 1.27mm hexagonal wrench.

Caution:

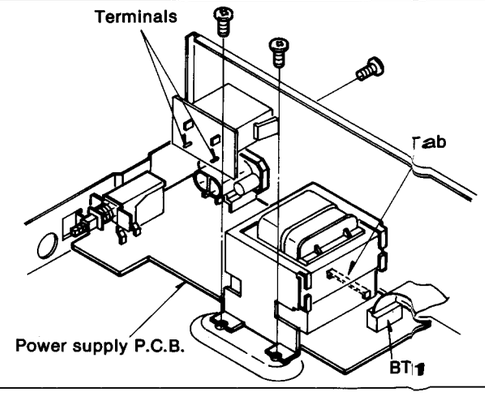
Refer to turntable height adjustment (see page 18),



Ref. No. 13 — How to remove the power transformer

Procedure 1→2→3→4→13

1. Remove the connector (BT11).
2. Remove the 3 screws.
3. Release the Tab.
4. Unsolder the terminals.



D

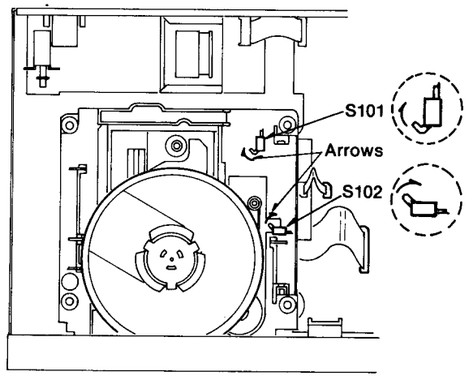
■ MEASUREMENTS AND ADJUSTMENTS

Caution:

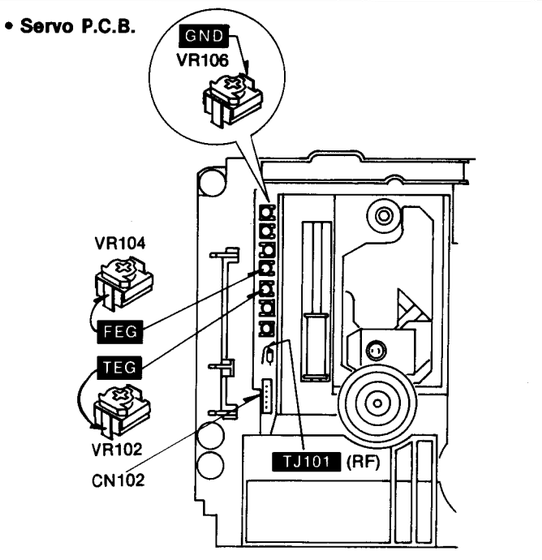
- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.)
  With the unit turned "on", laser radiation is emitted from the pickup lens.
  Avoid exposure to the laser beam, especially when performing adjustments.

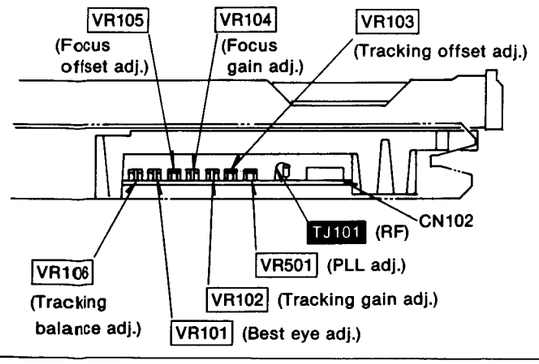
PREPARATION

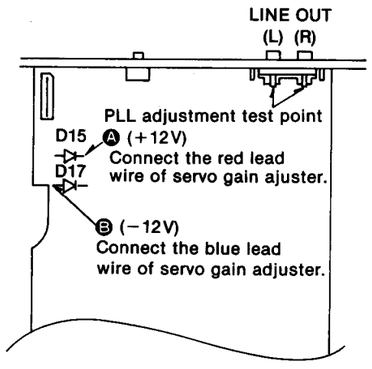
1. Remove the cabinet. (Refer to page 9.)
2. Remove the disc clamper and magnet. (Refer to page 9.)
3. Remove the disc holder and power switch rod. (Refer to page 9.)
4. Place the test disc and magnet on the turntable.
5. Turn "ON" the power switch of the player, while holding the levers of the switches (S101, S102) in the direction of the arrow.
6. Release the levers of the switches (S101, S102) after the test disc starts rotating.



ADJUSTMENT POINTS







ELECTRICAL ADJUSTMENT

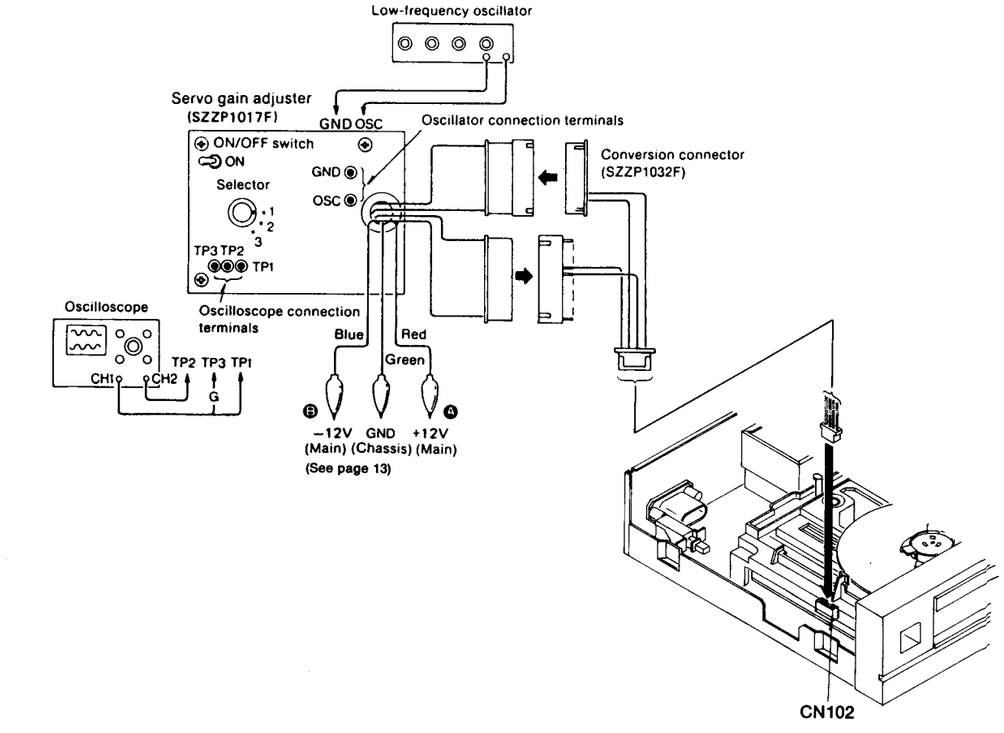
Measuring Instruments and Special Tools

- Servo gain adjuster (SZZP1017F)
- Test discs
  Test disc (SZZP1014F) old or new type
  Inspection test disc (SZZP1054C)
  Uneven disc (SZZP1056C)
  Black band disc (SZZP1057C)
- Ordinary disc
- Two-channel oscilloscope (with trigger) of 30MHz or over
- Low frequency oscillator
- Conversion connector(SZZP1032F)

Adjustment Procedure

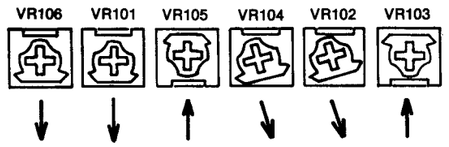
Step 1: Make the temporary setting of each VR . (Refer to page 15.)
↓
Step 2: Best eye (PD balance) adjustment. (Refer to page 15.)
↓
Step 3: Connect the servo gain adjuster. (Refer to page 14.)
↓
Step 4: Focus gain adjustment. (Refer to page 15.)
↓
Step 5: Tracking gain adjustment. (Refer to page 15.)
↓
Step 6: Focus offset adjustment (Refer to page 16.)
↓
Step 7: Tracking offset adjustment. (Refer to page 16.)
↓
Step 8: Tracking offset balance adjustment. (Refer to page 16.)
↓
Step 9: Disconnect the servo gain adjuster.
↓
Step 10: PLL adjustment. (Refer to page 17.)
↓
Step 11: Check of play operation after adjustment. (Refer to page 17.)

Connection of Servo Gain Adjuster



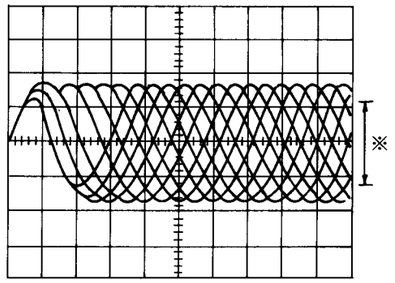
TEMPORARY SETTING OF EACH VR

Note :
If a disc skips or can not be played back, adjust each VR temporarily, as shown.



BEST EYE(PD BALANCE) ADJUSTMENT

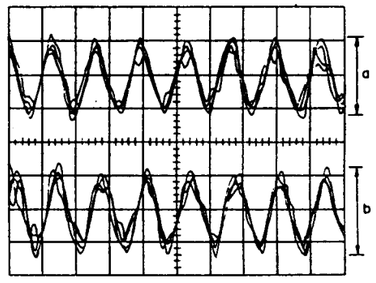
1.Connect CH1 of the oscilloscope to **TJ101** (+) and **GND** (-) of the servo P.C.B.
Oscilloscope setting:VOLT.....200mV
SWEEP.....0.5µsec.
INPUT.....AC
2.Set a test disc (SZZP1014F or SZZP1054C) and turn **ON** the power switch of the player. (Refer to page 13.)
3.Set the player to the play mode.
4.Adjust **VR101** so that the eye pattern of RF signal is stretched to maximum.
5.Turn **OFF** the power switch of the player.



※ Most stretched eye pattern.

FOCUS GAIN ADJUSTMENT

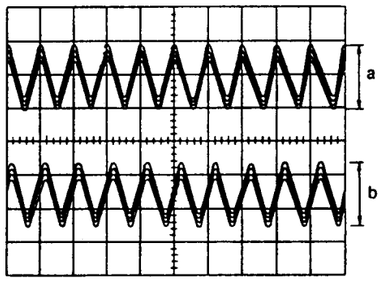
1.Connect the servo gain adjuster.(Refer to page 12.)
2.Set the selector switch of the servo gain adjuster to **2** and ON-OFF switch to **ON.**
3.Set the low frequency oscillator to a frequency of **825Hz** and an output voltage of **100mVp-p.** Then connect the oscillator to **OSC** (+) and **GND** (-) terminals of the servo gain adjuster.
4.Connect CH1 and CH2 of the oscilloscope to **TP1** and **TP2** of the servo gain adjuster.(**TP3** is the ground terminal.)
Oscilloscope setting:VOLT.....100mV(both channels)
SWEEP.....1msec.
INPUT.....DC
5.Set a test disc (SZZP1014F or SZZP1054C) and turn **ON** the power switch of the player.(Refer to page 13.)
6.Set the player to the play mode.
7.Set the selector switch of the servo gain adjuster from **"2" to "3".**
8.**825Hz** signals will be displayed on the oscilloscope. Adjust **VR104** until the waveform amplitudes of both channels are equal.
9.Shift the selector switch of the servo gain adjuster from **"3" to "2".**



* Make a=b

TRACKING GAIN ADJUSTMENT

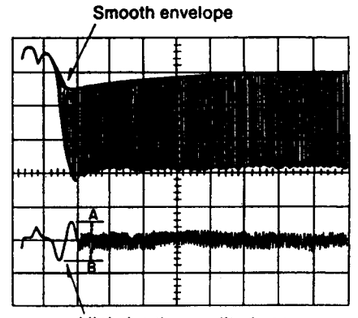
1.Oscilloscope setting and connections are the same as above.
2.Set the low frequency oscillator to a frequency of **1.0kHz** and an output voltage of **100mVp-p.**
3.Set the selector switch of the servo gain adjuster from **"2" to "1".**
4.**1.0kHz** signals will be displayed on the oscilloscope. Adjust **VR102** until the waveform amplitudes of both channels are equal.
5.Shift the selector switch of the servo gain adjuster from **"1" to "2".**



*Make a=b

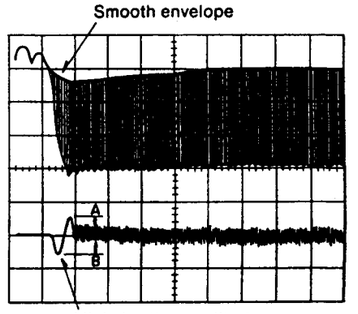
FOCUS OFFSET ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ101** (+) and **GND** (-) of the servo P.C.B.
Connect CH2 of the oscilloscope to **FEG** (+) and **GND** (-) of the servo P.C.B.
Oscilloscope setting:VOLT.....200mV(CH1),
500mV(CH2)
SWEEP.....0.5msec.
INPUT.....AC(CH1),DC(CH2)
MODE.....NORM
(Triggering via CH1)
2.Set the test disc (SZZP1057C) and turn **ON** the power switch of the player. (Refer to page 13.)
3.Set the player to the play mode.
4.Check the waveform of CH1 and CH2 on the oscilloscope and adjust **VR105**, so that the waveform around the triggering point becomes as shown in the illustration.



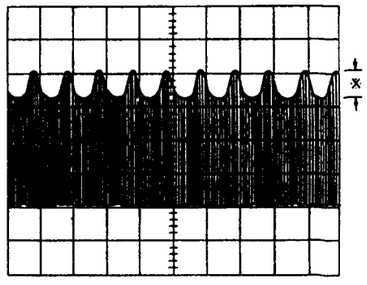
TRACKING OFFSET ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ101** (+) and **GND** (-) of the servo P.C.B.
Connect CH2 of the oscilloscope to **TEG** (+) and **GND** (-) of the servo P.C.B.
Oscilloscope setting:VOLT.....200mV(CH1),
500mV(CH2)
SWEEP.....0.5msec.
INPUT.....AC(CH1),DC(CH2)
MODE.....NORM
(Triggering via CH1)
2.Set the test disc (SZZP1057C) and turn **ON** the power switch of thé player.(Refer to page 13.)
3.Set the player to the play mode.
4.Check the waveform of CH1 and CH2 on the oscilloscope and adjust **VR103,** so that the waveform around the triggering point becomes as shown in the illustration.



TRACKING OFFSET BALANCE ADJUSTMENT

1.Set the low frequency oscillator to a frequency of **1kHz** and an output voltage of **200mVp-p**. Then connect the oscillator to **OSC** (+) and **GND** (-) terminals of the servo gain adjuster.
2.Connect CH1 of the oscilloscope to **TJ101** (+) and **GND** (-)of the servo P.C.B.
Oscilloscope setting:VOLT.....500mV
SWEEP.....0.5msec.
INPUT.....AC
2.Set a test disc (SZZP1014F or SZZP1054C) and turn **ON** the power switch of the player.(Refer to page 13.)
4.Set the player to the play mode.
5.Set the selector switch of the servo gain adjuster from **"2"** to **"1".**
6.Adjust **VR106,** so that the output waveform is as shown (jitter is minimized).
7.Shift the selector switch of the servo gain adjuster from **"1"** to **"2".**
8.Turn **OFF** the power switch of the player.
9.Disconnect the servo gain adjuster.

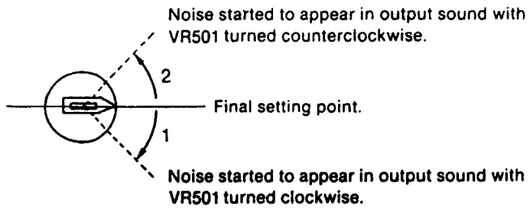


*Jitter should be minimized.

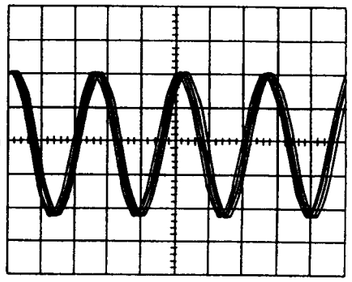
D

PLL ADJUSMENT

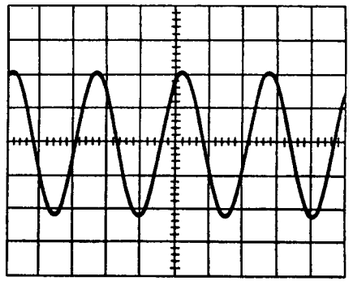
1.Connect CH1 of the oscilloscope to the **LINE OUT terminal** (either of Lch or Rch) and **ground.**
Oscilloscope setting:VOLT.....1V
SWEEP.....1msec.
INPUT.....DC
2.Set the test disc (SZZP1054C) and turn **ON** the power switch of the player. (Refer to page 13.)
3.Play **Track No.6 (wedge 0.7mm)** of the test disc.
4.Check the waveform displayed on the oscilloscope and adjust **VR501** in the following steps.
Step 1. Turn **VR501** clockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.
Step 2. Turn **VR501** counterclockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.
Step 3. Set **VR501** in the middle between the points observed in the above steps " 1 " and " 2 " .


Noise started to appear in output sound with VR501 turned counterclockwise.
2
Final setting point.
1
Noise started to appear in output sound with VR501 turned clockwise.

• NG



• OK



CHECK OF PLAY OPERATION AFTER ADJUSTMENT

Check of skip search
1.Play an ordinary disc.
2.Press the skip button and verify skip search operation (forward and reverse).

Check of manual search
1.Play an ordinary disc.
2.Press the manual search button and verify that smooth manual search can be performed at low and high speeds (forward and reverse).

Check of playability
1.Play the test disc (SZZP1054C).
2.Play the track No.6 (wedge 0.7mm) and verify that there is no skip sound or noise.
3.Play the track No.13 (black dot 0.7mm) and verify that there is no skip sound or noise.

OPTICAL PICKUP ADJUSTMENT

Measuring Instruments and Special Tools

- Two-channel oscilloscope (with trigger) of 30MHz or over
- Test discs
  Test disc (SZZP1014F) old or new type
  Inspection test disc (SZZP1054C)
  Uneven disc (SZZP1056C)
- Hexagonal wrench (2.0mm)
- Screw lock paint (RZZ0L01)
- Hexagonal wrench (1.27mm)
- Feeler gauge (RZZ0297)
- Filter (Refer to page 18)

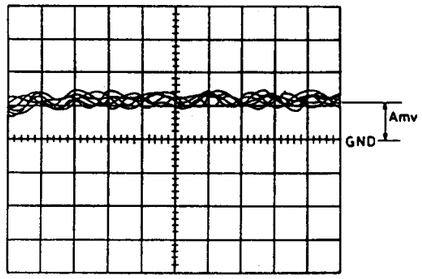
Adjustment Procedure

- If the optical pickup and spindle motor are replaced , adjust it according to the following procedure.

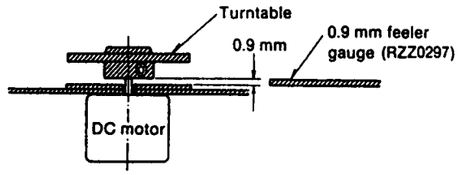
Step 1: Make the temporary of each VR. (Refer to page 15.)
↓
Step 2: Turntable height adjustment. (Refer to page 18.)
↓
Step 3: Mechanical adjustment. (Refer to page 18.)
↓
Step 4: Electrical adjustment. (Refer to page 14.)

TURNTABLE HEIGHT ADJUSTMENT

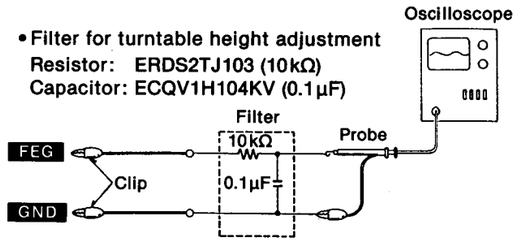
1.Connect CH1 of the oscilloscope to **FEG** (+) and **GND** (-) of the servo P.C.B.through the filter as shown below.
Oscilloscope setting:VOLT.....50mV
SWEEP.....1msec.
INPUT.....DC
2.Set the oscilloscope to DC zero balance.
3.Set a test disc (SZZP1014F or SZZP1054C and turn **ON** the power switch of the player.(Refer to page 11.)
4.Set the player to the play mode.
5.Measure the DC level (AmV) displayed on the oscilloscope.
- If the value of A is within the range of ± 60mV , the turntable height is correct. If it is not within this range , make the necessary adjustments using the 0.9mm feeler gauge (RZZ0297).
If A is more than +60mV , make the turntable lower.
If A is less than -60mV , make the turntable higher.



Adjust the turntable height as follow:
A.Insert the 0.9mm feeler gauge (RZZ0297) as shown below.

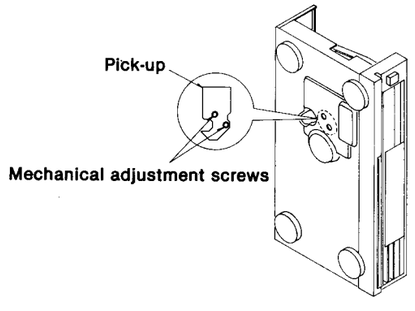


B.Loosen the turntable set-screw.
C.Adjust turntable height to 0.9mm with the feeler gauge as shown above.
D.Tighten the turntable set-screw by using the 1.27mm hexagonal wrench.
E.Check the turntable height adjustment by following steps 1 ~ 5 above.

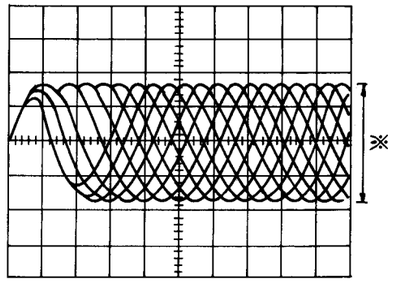


MECHANICAL ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ101** (+) and **GND** (-) of the servo P.C.B.
Oscilloscope setting:VOLT.....200mV
SWEEP.....0.5μsec.
INPUT.....AC
2.Set the test disc (SZZP1056C) and turn **ON** the power swith of the player. (Refer to page 13.)
3.Using the manual search buttons , move the pickup so that the mechanical adjustment screws line up with the adjustment holes in the bottom panel.



4.Monitoring RF signal on the oscilloscope, adjust **the two adjusting screws** alternatelywith the 2.0mm hexagonal wrench so that the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.
5.Turn **OFF** the power switch of the player.
6.After the adjustment, apply **screw lock paint(RZZ0L01)** to the adjusting screws.



Note: The mechanical adjustment screws have been already locked with screw lock paint at the factory. It might be hard to turn them.

■TERMINAL FUNCTION OF LSI

● MN6622 (Digital Signal Processing: EFM Decoder, Error Correction, CLV Servo)

Pin No.	Mark	I/O	Function
1	MEMP	I	Emphasis signal input
2	PC	O	Spindle motor "ON" signal (ON at "L")
3	EC	O	Spindle motor drive signal
4	FG	I	Not connected
5	TTF	I	Not used (connected to GND)
6	FLAG0	O	Not connected
7	IPFLAG	O	Not connected
8	FLAG6	O	Not connected
9	PCK	I	PLL extract clock input (4.2336MHz)
10	VDD	I	Power supply (connected to +5V)
11	EFM	I	EFM signal input (PLL)
12	SRF	I	EFM signal input (DSL)
13	DO	I	Drop-out signal ("H" at drop-out)
14	CLVS	O	Not connected
15	FPC	O	PLL frequency comparison signal
16	BSSEL	O	Not connected
17	SRF0	I	Synchro rec control signal input
18	FSL	I	Not used (connected to GND)
19	SLEEP	I	Not used (connected to GND)
20	SUBC	O	Not connected
21	SBCK	I	Not connected
22	BLKCK	O	Sub-code block (Q-data) clock (75Hz)
23	$\overline{\text{CLDCK}}$	O	Sub-code frame (Q-data) clock (7.35kHz)
24	$\overline{\text{SUBQ}}$	O	Sub-code (Q-data) output
25	CRC	O	Not connected
26	$\overline{\text{RST}}$	O	Reset signal input ("L"=Reset)
27	MLD	I	Data input (command load)
28	MCLK	I	Data clock input (command clock)
29	MDATA	I	Data input (command data)
30	DMUTE	I	Muting control (Not used, connected to GND)
31	$\overline{\text{TRON}}$	I	Tracking servo "ON" signal (ON at "L")
32	STAT	O	Processing condition (CRC, OTC, CLVOK, TT, STOP) output

Pin No.	Mark	I/O	Function
33	TX	O	Digital output signal
34	$\overline{\text{TSTR}}$	I	Not used (connected to +5V)
35	$\overline{\text{TEST}}$	I	Not used (connected to +5V)
36	VSS	I	GND terminal
37	X2	O	Not connected
38	X1	I	Clock input (16.9344MHz)
39	SEL	I	Not used (connected to GND)
40	LDG/ WDCKS	O	Not connected
41	RDG	O	Not connected
42	DEMPH	O	Not connected
43	SMCK	O	Clock output (4.2336MHz)
44	WS	O	Not connected
45	SRCK	O	Not connected
46	XCK	O	Not connected
47	DA15/ SRDATA	O	DA parallel output (MSB)/serial data output (MSB FIRST)
48	DA14/ SRDATA	O	Not connected
49	DA13/ SCK	O	DA parallel output/serial data output bit clock
50	DA12/ WDCK	O	Not connected
51	DA11/ BYTCK	O	Not connected
52	VSS	I	GND terminal
53	DA10/R/L	O	DA parallel output/R/L signal (R at "H")
54 ~ 56	DA9 ~ DA7	O	Not connected
57	DA6	O	Not used (connected to GND)
58 ~ 63	DA5 ~ DA0	O	Not connected
64 ~ 71	D7 ~ D0	I/O	16K RAM DATA
72	RAMOE	O	16K RAM OE signal
73	RAMWE	O	16K RAM WE signal
74 ~ 84	RAMA0 ~ RAMA10	O	16K RAM address

● AN8370S (Optical Servo Control)

Pin No.	Mark	I/O Division	Function
1	VEE	I	Power supply (connected to −5V)
2	LSA	I	Phase difference input (A)
3	GND	I	GND terminal
4	LSB	I	Phase difference input (B)
5	APC	O	Auto laser power control output
6	TEOUT	O	Tracking error signal output
7	TEG	I	Tracking error gain adjusting input
8	TE(+)	I	Phase difference to voltage conversion (+)
9	TE(−)	I	Phase difference to voltage conversion (−)
10	APC(−)	I	Laser power inversion input
11	C.MEM	I	Capacitor connection for phase difference memory
12	APC(+)	I	Laser power non inversion input
13	VREFE	O	Reference current generation
14	SENSE	O	Selector output (track-crossed)
15	HIN	I	Tracking hold circuit input
16	HOUT	O	Tracking hold circuit output
17	SPCNT	O	Trackcrossing speed control output (Not used, open)
18	C.MSP	I	Trackcrossing reference speed setting capacitor connection (Not used, open)
19	C.AF	I	Auto focus timer capacitor connection
20	KICK	O	Track kick signal output
21	VCC	I	Power supply (connected to +5V)
22	CNT1	I	Control input (FOON Focus servo "ON" signal)

Pin No.	Mark	I/O Division	Function
23	CNT2	I	Control input (TRON Tracking servo ON signal)
24	CNT3	I	Control input (KICKF Kick direction [Foward] command)
25	CNT4	I	Control input (KICKR Kick direction [Reverse] command)
26	F.LOCK	O	Focus lock signal output
27	C.FBDO	O	Capacitor connection for inversion RF high detection
28	C.SBDO	O	Capacitor connection for inversion RF low detection
29	C.SBRT	O	Capacitor connection for non-inversion RF slow detection
30	C.FBRT	O	Capacitor connection for non-inversion RF fast detection
31	RF OUT	O	RF signal output
32	BDO	O	Drop-out detection output
33	RF IN	I	RF signal input
34	S.OUT	O	Focus search signal output
35	C.LW	I	Capacitor connection for triangular wave generation
36	FE.OUT	O	Focus error signal output
37	FEG	I	Focus error gain adjusting input
38	FE.REF	I	Focus error comparison voltage generation
39	PDB	I	Photo detection current input (B)
40	IVB	O	Current/voltage conversion (B)
41	IVA	O	Current/voltage conversion (A)
42	PDA	I	Photo detection curent input (A)

● AN8371S (Data slice and PLL)

Pin No.	Mark	I/O Division	Function
1	VEE	I	Power supply (connected to −5V)
2	SRF	O	RF signal output data-sliced into digital value
3	EFM	O	EFM signal output synchronized with PCK
4	D.GND	I	GND terminal (digital system)
5	PCK	O	Clock output extracted from SRF
6	VCC	I	Power supply (connected to +5V)
7	VA	I	VCO free run frequency adjusting current input (not connected)
8, 9	VC1, 2	I	Capacitor connection for VCO oscillator frequency
10	VR	I	Resistor connection for VCO oscillator frequency
11	PD	I	Capacitor connection for PLL DO protection
12	PL1	I	PLL loop filter connection

Pin No.	Mark	I/O Division	Function
13	PL2	I	PLL loop filter connection
14	FPC	I	Frequency comparison error signal input
15	RF	I	RF signal input
16	ARF	O	RF signal output with AGC output
17	AGC	I	ARF signal input for AGC drop-out detection input
18	AC	I	Loop filter for AGC connected
19	DO	O	Drop-out detection pulse output
20	A.GND	I	GND terminal (analog system)
21	DSL	I	RF signal input for data slicing
22	SLC	I	Slicing level control signal input
23	FC1	I	Filter capacitor for data slicer connected
24	FC2	I	Filter capacitor for data slicer connected

● MN1554PEP (System Control)

Pin No.	Mark	I/O Division	Function
1	BRECV	——	(Not used, open)
2	BSEND	——	(Not used, open)
3	SYNC	O	(Not used, open)
4	SIRQ	I	Not used (connected to +5V)
5	BLKCK	I	Sub-code block (Q data) clock input (75Hz)
6	CLDCK	I	Sub-code block (Q data) clock input (7.35kHz)
7	SBO	I	(Not used, open)
8	SUBQ	I	Sub-code (Q data) input
9	RST	I	Reset signal input
10 ⟆ 13	P20 ⟆ P23	O	Not used (connected to +5V)
14	CLOSE	O	Loading motor "Close" command
15	OPEN	O	Loading motor "Open" command
16	SLOW	O	(Not used, open)
17	MUTE	O	Muting control
18	SEEK	O	Traverse servo control (Not used, open)
19	NC	–	Not connected
20	TRV.R	O	Traverse "Reverse" command signal
21	TRV.F	O	Traverse "Forward" command signal
22	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [reverse] command)
23	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [forward] command)
24	CNT2	O	Optical servo IC control (TRON: Tracking servo)
25	VDD	I	Power supply (connected to +5V)
26	DOWN	O	(Not used, open)
27	UP	O	(Not used, open)
28	CNT1	O	Optical servo IC control signal (FOON: Focus servo)

Pin No.	Mark	I/O Division	Function
29	CLOSE	I	Disc holder "Open" detection
30	OPEN	I	Disc holder "Close" detection
31	BCLK	I	(Not used, connected to GND)
32	BDATA	I	(Not used, connected to GND)
33	STAT	I	Processing status input from signal processing LSI
34	COMP	O	TOC reading control (ON at "L") (connected to GND)
35	FLOCK	I	Optical servo condition (focus) input
36	SENSE	I	Optical servo condition (track cross) input
37	RECV	I	Data receipt command signal
38	SEND	I	Data transmission command
39	ACK	I	Data discrimination signal
40	CLK	I	Data lock signal
41 ⟆ 44	DATA0 ⟆ DATA3	I	Key scan signal
45 ⟆ 52	NC	I	Not connected
53	OSC2	I	Clock terminal
54	OSC1	I	Clock input
55	X1	I	Optical servo condition input
56	X0	O	(Not used, open)
57	GND	I	GND terminal
58	DMUTE	O	Muting control
59	MDATA	O	Command data output
60	MCLK	O	Data clock output (command clock)
61	MLD	O	Data output (command load)
62	DOUTON	O	Optical output control signal (Not used, open)
63	EMPH	O	Emphasis signal output
64	NC	——	Not connected

• MN15283PEM (FL Drive and Timing Signal Generator)

Pin No.	Mark	I/O Division	Function
1	VSS	I	GND terminal
2	X0	O	(Not used, open)
3	X1	I	Optical servo condition input (Not used, open)
4	PO0 (RECV)	O	Data receipt command signal
5	PO1 (SEND)	O	Data transmission command signal
6	PO2 (ACK)	O	Data discrimination signal
7	PO3 (CLK)	O	Data lock signal
8 ⟆ 11	P10 (D0) ⟆ P13 (D3)	O	Key scan signal
12	$\overline{\text{SYNC}}$	O	(Not used, open)
13	$\overline{\text{RST}}$	I	Reset signal input (reset at "L")
14	$\overline{\text{IRQ/TC1}}$	I	Sub-code block (Q data) clock (75Hz) input (Not used, open)
15 • 16	P50 • P51	I	Key return signal
17	P52	I	Timer play control signal
18	P53 (EST)	I	End detection signal of CD editing recording.
19	$\overline{\text{SBT}}$	I	Sub-code frame clock (7.35kHz) (Not used, open)
20	$\overline{\text{SBD}}$	I	Sub-code Q data input (Not used, open)

Pin No.	Mark	I/O Division	Function
21	P20 (CEM)	O	CD recording signal
22	P21 (PLE)	O	CD play signal
23 • 24	P22 • P23	O	Synchro rec control signal
25 ⟆ 28	P30 ⟆ P33	—	(Not used, open)
29 ⟆ 32	P40 ⟆ P43	I	Key return signal
33	P60	I	(Not used, connected to +5V)
34 • 35	P61 • DAC	—	(Not used, open)
36	VPP	I	FL drive power supply (connected to −33V)
37 ⟆ 52	D0 ⟆ D9 • DA ⟆ DF	O	FL grid signal
53 ⟆ 61	S0 ⟆ S8	O	FL anode signal
62	VDD	I	Power supply (connected to +5V)
63	OSC2	I	Clock terminal
64	OSC1	I	Clock input

● MN6623 (Digital Filter and D/A Converter)

Pin No.	Mark	I/O Division	Function
1	MLD	I	Command load input (load: L)
2	RSTB	I	Reset signal input (reset at "L")
3	IE	I	I²S select terminal ("H"=I²S)
4	TP1	——	TEST terminal (Not connected)
5	TP2	——	
6	TEST1	I	TEST terminal 1 (connected to GND)
7	TEST2	I	TEST terminal 2 (connected to GND)
8	NC	——	Not connected
9	NC	——	Not connected
10	AVDD4	I	Power supply (connected to +5V)
11	OUTR(−)	O	Rch data output, (−) terminal
12	AVSS4	I	GND terminal
13	AVSS3	I	GND terminal
14	OUTR(+)	O	Rch data output, (+) terminal
15	AVDD3	I	Power supply (connected to +5V)
16	NC	——	Not connected
17	AVDD2	I	Power supply (connected to +5V)
18	OUTL(−)	O	Lch data output, (−) terminal
19	AVSS2	I	GND terminal (analog system)
20	AVSS1	I	GND terminal (analog system)
21	OUTL(+)	O	Lch data output, (+) terminal

Pin No.	Mark	I/O Division	Function
22	AVDD1	I	Power supply (connected to +5V)
23	AVDD1	I	Power supply (connected to +5V)
24	DVSS1	I	GND terminal (digital system)
25	X2	O	Clock output
26	X1	I	Clock input
27	NC	——	Not connected
28	DVDD2	I	Power supply (connected to +5V)
29	DVSS2	I	GND terminal (digital system)
30	NSUB	I	Not used (connected to GND)
31	768fs	O	768 fs (Not used)
32	192fs	O	192 fs (Not used)
33	LRPOL	I	LR clock selector (Not used)
34	LR	I	L/R clock
35	SRCK	I	Serial data best clock
36	SRDATA	I	Serial data input (MSB first)
37	DVSS 3	I	GND terminal (digital system)
38	NC	——	Not connected
39	384 fs	O	384 fs (16.9344MHz) output
40	PD	I	Power down terminal
41	MDATA	I	Command data input
42	MCLK	I	Command clock input

■ REPLACEMENT PARTS LIST (Electrical parts)

Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC11	LM2940T5	I.C. REGULATOR
IC13	SVIBA4558F	I.C. REGULATOR
IC101	AN8370S	I.C. OPITICAL SERVO
IC102	MN6636	I.C. ANALOG SW
IC103	AN6554NS	I.C. OPERATION AMP.
IC104	AN6552S	I.C. REGULATOR
IC105	AN6552S	I.C. REGULATOR
IC106	AN6552S	I.C. REGULATOR
IC201	LM2940T5	I.C. REGULATOR
IC202	AN6552S	I.C. REGULATOR
IC301	MN6622	I.C. LSI
IC302	SVICXK5816M	I.C. 16K RAM
IC401	MN1554PEP	I.C. CONTROL
IC402	SVIBA4558F	I.C. REGULATOR
IC501	AN8371S	I.C. DATA SLICE PLL
IC601	MN15283PEM	I.C. OPERATION AMP.
IC602	HC-MD10E	I.C. REMOTE SENSOR
IC801	MN6623A	INTEGRATED CIRCUIT. DF DAC
IC803	LM833M	I.C. LPF
IC804	NJM4560M	I.C. OPERATION AMP.
IC805	SVIH8DN2175	I.C. LPF
IC806	SVIH8DN2175	I.C. LPF
IC809	SVIT0TX172	I.C
TRANSISTORS		
Q11	2SB1240QTV6	TRANSISTOR
Q12	2SB1240QTV6	TRANSISTOR
Q13	2SA1547QSTV3	TRANSISTOR
Q14	2SD1862-P	TRANSISTOR
Q15	2SB1240QTV6	TRANSISTOR
Q16	2SD1862-P	TRANSISTOR
Q101	2SA1547-Q	TRANSISTOR
Q141	2SD1862-P	TRANSISTOR
Q142	2SB1240-P	TRANSISTOR
Q161	2SD1862-P	TRANSISTOR
Q162	2SB1240-P	TRANSISTOR
Q181	2SD1862-P	TRANSISTOR
Q182	2SB1240-P	TRANSISTOR
Q201	2SD1862-P	TRANSISTOR
Q203	2SD1862-P	TRANSISTOR
Q301	DTC124ES	TRANSISTOR
Q351	DTA124EST	TRANSISTOR
Q401	2SD1862-P	TRANSISTOR
Q402	2SB1240QTV6	TRANSISTOR
Q403	2SD1862-P	TRANSISTOR
Q404	2SB1240QTV6	TRANSISTOR
Q405	DTC124ES	TRANSISTOR
Q406	DTC124ES	TRANSISTOR
Q407	DTC124ES	TRANSISTOR
Q601	DTC124ES	TRANSISTOR
Q602	DTC124ES	TRANSISTOR
Q603	DTC124ES	TRANSISTOR
Q604	DTC124ES	TRANSISTOR
Q605	DTC124ES	TRANSISTOR
Q606	DTC124ES	TRANSISTOR
Q607	DTC124ES	TRANSISTOR
Q608	DTC124ES	TRANSISTOR
Q609	DTC124ES	TRANSISTOR
Q610	DTC124ES	TRANSISTOR
Q611	DTC124ES	TRANSISTOR
Q612	DTC124ES	TRANSISTOR
Q801	2SC3311A-Q	TRANSISTOR
Q802	2SC3311A-Q	TRANSISTOR
Q803	2SD1330R	TRANSISTOR
Q804	2SD1330R	TRANSISTOR
Q805	2SC3311A-Q	TRANSISTOR
Q806	2SC3311A-Q	TRANSISTOR
Q851	DTA124EST	TRANSISTOR
Q852	DTC124ES	TRANSISTOR
Q853	DTA114EST	TRANSISTOR
Q854	DTC124ES	TRANSISTOR
Q855	DTA124EST	TRANSISTOR
Q856	DTA124EST	TRANSISTOR
DIODES		
D11 ⚠	SVD1SR35200A	RECTIFIER
D12 ⚠	SVD1SR35200A	RECTIFIER
D13 ⚠	SVD1SR35200A	RECTIFIER
D14 ⚠	SVD1SR35200A	RECTIFIER
D15 ⚠	SVD1SR35200A	RECTIFIER
D16	MA4300MHTA	DIODE
D17 ⚠	SVD1SR35200A	RECTIFIER
D19	MA4062HTA	DIODE
D23	MA4056-M	DIODE
D24	MA4150MHTA	DIODE
D25	MA4150MHTA	DIODE
D181	SVD1SS254	DIODE
D182	SVD1SS254	DIODE
D183	SVD1SS254	DIODE
D184	SVD1SS254	DIODE
D201	MA4056-M	DIODE
D410	MA4033	DIODE
D411	SVD1SS254	DIODE
D601	SVD1SS254	DIODE
D602	SVD1SS254	DIODE
D603	SVD1SS254	DIODE
D604	SVD1SS254	DIODE
D605	SVD1SS254	DIODE
D851	SVD1SS254	DIODE
D852	SVD1SS254	DIODE
D853	SVD1SS254	DIODE
D854	SVD1SS254	DIODE
D855	SVD1SS254	DIODE
D856	SVD1SS254	DIODE
D857	SVD1SS254	DIODE
I.C.PROTECTORS		
ICP1 ⚠ (EK, XA, XB)	SRUF38	I.C.PROTECTOR
ICP2 ⚠ (EK, XA, XB)	SRUF38	I.C.PROTECTOR
ICP11 ⚠ (EK)	SRUN15	I.C.PROTECTOR
ICP12 ⚠ (EK)	SRUN15	I.C.PROTECTOR
VARIABLE RESISTORS		
VR101	EVND3AA00B53	V.R. BEST EYE ADJ.
VR102	EVND3AA00B14	V.R. TR GAIN ADJ.
VR103	EVND3AA00B14	V.R. TR OFFSET ADJ.
VR104	EVND3AA00B14	V.R. FO GAIN ADJ.
VR105	EVND3AA00B14	V.R. FO OFFSET ADJ.
VR106	EVND3AA00B53	V.R. TR BALANCE ADJ.
VR501	EVND3AA00B13	V.R. PLL ADJ.
MAGNET RESISTOR ELEMENTS		
RA1	EWS7L0A00Q53	RESISTANCE UNIT
COILS AND TRANSFORMERS		
L1 ⚠ (E, EG, EB, EH) (EF, EI)	SLQX400-D	COIL
L2 ⚠ (E, EG, EB, EH) (EF, EI)	SLQX400-D	COIL
L404	ELEY3R3KA	COIL
L901	ELEY3R3KA	COIL
L902	ELEY3R3KA	COIL
L903	ELEY3R3KA	COIL
T1 ⚠ (E, EG, EB, EH) (EF, EI)	SLTD5V081E	POWER TRANSFORMER
T1 ⚠ (EK, XL)	SLTD5V082G	POWER TRANSFORMER

Ref. No.	Part No.	Description
T1 (XA, XB, PC)	⚠ SLTD5V083X	POWER TRANSFORMER
OSCILLATORS		
X801	SVQ49U338S	OSCILLATOR
DISPLAYS		
FL601	SADFV266G	DISPLAY TUBE
FUSES		
F1 (E, EG, EB, EH) (EF, EI, EK) (XL)	⚠ XBA2C012TB0	FUSE, 250V, T125mA
F1 (XB, XA, PC)	⚠ XBA2C025TB0	FUSE, 250V, T250mA
F2 (E, EG, EB, EH) (EF, EI)	⚠ XBA2C08TB0	FUSES 250V,T800MA
SWITCHES		
S1	⚠ ESB8249V	SW, POWER
S2 (XA, PC, XB)	⚠ SSR187-1	SW, VOLTAGE SELECTOR
S101	SSPD17	SW, LOADING DET.
S102	SSPD18	SW, LOADING DET.
S601	EVQQS405K	SW, CH1
S602	EVQQS405K	SW, CH2

Ref. No.	Part No.	Description
S603	EVQQS405K	SW, CH3
S604	EVQQS405K	SW, CH4
S605	EVQQS405K	SW, CH5
S606	EVQQS405K	SW, CH6
S607	EVQQS405K	SW, CH7
S608	EVQQS405K	SW, CH8
S609	EVQQS405K	SW, CH9
S610	EVQQS405K	SW, CH10
S611	EVQQS405K	SW, PROGRAM
S612	EVQQS405K	SW, CANCELL
S613	EVQQS405K	SW, TIME
S614	EVQQS405K	SW, REPEAT
S615	EVQQS405K	SW, RECALL
S616	EVQQS405K	SW, SKIP(FOR)
S617	EVQQS405K	SW, SKIP(BACK)
S618	EVQQS405K	SW, +10
S619	EVQQS405K	SW(0)
S620	EVQQS405K	SW, A/B
S621	EVQQS405K	SW, EDIT
S622	EVQQS405K	SW, OPEN/CLOSE
S623	EVQQS405K	SW, STOP/CLEAR
S624	EVQQS405K	SW, PAUSE
S625	EVQQS405K	SW, PLAY
S626	EVQQS405K	SW, SCAN
S627	EVQQS405K	SW, WARP
S628	EVQQS405K	SW, LINK
S651	SSS148	SLIDE SWITCH, TIMER PLAY

Ref. No.	Part No.	Description
PACKING MATERIAL		
P1 (E, EG, EB, EH) (EI, EK, XL) (XA, XB, PC)	SPND311	PACKING CASE
P1 (EF)	SPND312	PACKING CASE
P2	SPSD149	PAD(REAR)
P3	SPSD148	PAD(FRONT)
P4	XZB50X50A01	PROTECTION BAG
P5	SPSD101	PROTECTION SHEET
P6	XZB23X20C03	PROTECTION BAG
P7	SPSD152	ACCESSORY BOX
ACCESSORIES		
A1 (E, EB, EH, EG) (EF, EI)	⚠ SFDAC05E03	POWER CORD
A1 (XA, PC)	⚠ SJA168	POWER CORD
A1 (XL)	⚠ SJA173	POWER CORD
A1 (XB)	⚠ SJA183	POWER CORD

Ref. No.	Part No.	Description
(XB) A1 (EK)	⚠ SJA188	POWER CORD
A2	SJP2249-1	OUTPUT CORD
A3	SJP2257T	CORD, SYNCHRO REC
A4 (XA, XL)	SQUD324	INSTRUCTION MANUAL
A4 (EK)	SQUD326	INSTRUCTION MANUAL
A4 (EG)	SQUD327	INSTRUCTION MANUAL
A4 (EF)	SQUD328	INSTRUCTION MANUAL
A4 (EI)	SQUD329	INSTRUCTION MANUAL
A4 (PC)	SQUD330	INSTRUCTION MANUAL
A4 (XB)	SQULPJ45-KB	INSTRUCTION MANUAL
A4 (E, EB, EH)	SQULPJ45-KE	INSTRUCTION MANUAL
A6 (XA, PC, XB)	⚠ RJP120ZBS-H	AC PLUG ADAPTOR
A7	UM-4NE-2P	PRIMARY BATTERY
A8	SJPD16	OPTICAL OUTPUT CORD

■ RESISTORS AND CAPACITORS

Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Numbering System of Resistor

Example:

ERD	25	F	J	102
Type	Wattage (1/4W)	Shape	Tolerance	Value (1KΩ)
ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470Ω)

Numbering System of Capacitor

Example:

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001μF)	Tolerance	Peculiarity
ECEA	50	M	330	
Type	Voltage (50V)	Pecliarity	Value (33μF)	

● Capacity are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F).
● Resistance are in ohms (Ω), unless specified otherwise, 1K = 1,000Ω, 1M = 1,000kΩ

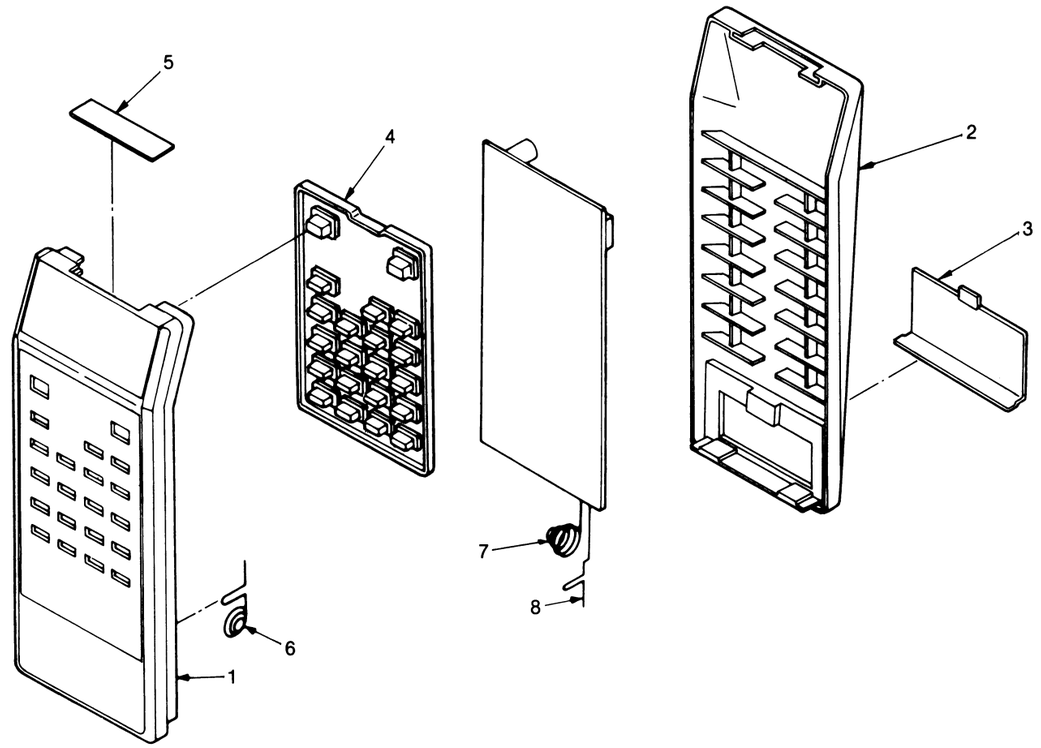
Resistor Type		Wattage		Tolerance
ERD	: Carbon	10 : 1/8W	12 : 1/2W	J : ±5%
ERG	: Metal Oxide	14 : 1/4W	25 : 1/4W	F : ±1%
ERQ	: Fuse Type Metal	1A : 1W	18 : 1/8W	G : ±2%
ERX	: Metal Film	S2 : 1/4W	S1 : 1/2W	J : ±5%
ERD L	: Carbon (chip)	2F : 1/4W	50 : 1/2W	K : ±10%
ERO K	: Metal Film (chip)	2A : 2W	3A : 3W	M : ±20%
ERC	: Solid	6G : 1/10W	8G : 1/8W	
ERF	: Incombustible Box-Shaped			
ERM	: Wire-Wound			
RRJ	: Cip Resistor			
ERJ	: Cip Resistor			

Capacitor Type		Voltage		Tolerance
ECE	: Electrolytic	0J : 6.3V	1A : 10V	K : ±10%
ECCD	: Ceramic	1C : 16V	1E : 25V	M : ±20%
ECKD	: Ceramic Capacitor	1H : 50V	1V : 35V	Z : +80 % −20
ECQM	: Poyester	50 : 50V	05 : 50V	
ECQP	: Polypropylene	2H : 500V	2A : 100V	J : ±5%
ECG	: Ceramic	1 : 100V	1J : 63V	G : ±2%
ECEA N	: Non Polar Electrolytic	KC : 400V AC		F : ±1%
QCU	: Ceramic (Chip Type)	KC : 125V AC		C : ±0.25pF
ECUX	: Ceramic (Chip Type)	(UL)		D : ±0.5pF
ECF	: Semiconductor			
EECW	: Liquid electrolyte double layer capacitor			

Ref.. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
RESISTORS(VALUE,WATTAGE)								
R11	ERDS2TJ101	100 1/4	R148	ERJ6GEYJ104V	100K 1/10	R205	ERJ6GEYJ682V	6.8K 1/10
R12	ERDS2TJ331	330 1/4	R149	ERJ6GEYJ152V	1.5K 1/10	R207	ERJ6GEYJ474V	470K 1/10
R13	ERDS2TJ103	10K 1/4	R150	ERJ6GEYJ103V	10K 1/10	R208	ERJ6GEYJ680V	68 1/10
R14	ERDS2TJ103	10K 1/4	R151	ERJ6GEYJ101V	100 1/10	R214	ERJ6GEYJ471V	470 1/10
R16	ERDS2TJ102	1K 1/4	R152	ERJ6GEYJ153V	15K 1/10	R217	ERJ6GEYJ331V	330 1/10
R17	ERDS2TJ392	3.9K 1/4	R153	ERJ6GEYJ270V	27 1/10	R218	ERJ6GEYJ101V	100 1/10
R18	ERDS2TJ392	3.9K 1/4	R154	ERJ8GEYJ3R3V	3.3 1/8	R219	ERJ6GEYJ103V	10K 1/10
R19	ERDS2TJ332	3.3K 1/4	R161	ERJ6GEYJ333V	33K 1/10	R230	ERJ6GEYJ223V	22K 1/10
R20	ERDS2TJ332	3.3K 1/4	R162	ERJ6GEYJ222V	2.2K 1/10	R231	ERJ6GEYJ273V	27K 1/10
R21	ERD25FVJ221T	220 1/4	R163	ERJ6GEYJ333V	33K 1/10	R232	ERJ6GEYJ681V	680 1/10
R22	ERDS2TJ221	220 1/4	R164	ERJ6GEYJ153V	15K 1/10	R233	ERJ6GEYJ471V	470 1/10
R25	ERDS2TJ821	820 1/4	R165	ERJ6GEYJ122	1.2K 1/10	R301	ERDS2TJ472	4.7K 1/4
R101	ERJ6GEYJ154V	150K 1/10	R166	ERJ6GEYJ102V	1K 1/10	R302	ERDS2TJ472	4.7K 1/4
R102	ERJ6GEYJ472V	4.7K 1/10	R167	ERJ6GEYJ681V	680 1/10	R303	ERDS2TJ472	4.7K 1/4
R103	ERJ6GEYJ472V	4.7K 1/10	R168	ERJ6GEYJ272V	2.7K 1/10	R304	ERDS2TJ472	4.7K 1/4
R104	ERJ6GEYJ223V	22K 1/10	R169	ERJ6GEYJ392V	3.9K 1/10	R305	ERDS2TJ472	4.7K 1/4
R105	ERJ6GEYJ334V	330K 1/10	R170	ERJ6GEYJ101V	100 1/10	R307	ERDS2TJ104	100K 1/4
R107	ERJ6GEYJ473V	47K 1/10	R171	ERJ6GEYJ270V	27 1/10	R308	ERDS2TJ561	560 1/4
R108	ERJ6GEYJ332V	3.3K 1/10	R172	ERJ8GEYJ3R3V	3.3 1/8	R309	ERDS2TJ472	4.7K 1/4
R109	ERJ6GEYJ822V	8.2K 1/10	R180	ERJ6GEYJ474V	470K 1/10	R311	ERDS2TJ472	4.7K 1/4
R110	ERJ6GEYJ682V	6.8K 1/10	R181	ERJ6GEYJ471V	470 1/10	R312	ERDS2TJ100	10 1/4
R111	ERJ6GEYJ682V	6.8K 1/10	R182	ERJ6GEYJ564V	560K 1/10	R313	ERDS2TJ100	10 1/4
R112	ERJ6GEYJ822V	8.2K 1/10	R183	ERJ6GEYJ564V	560K 1/10	R320	ERDS2TJ331	330 1/4
R113	ERJ6GEYJ152V	1.5K 1/10	R184	ERJ6GEYJ223V	22K 1/10	R351	ERDS2TJ103	10K 1/4
R114	ERJ6GEYJ152V	1.5K 1/10	R185	ERJ6GEYJ473V	47K 1/10	R352	ERDS2TJ334	330K 1/4
R115	ERJ6GEYJ102V	1K 1/10	R186	ERJ6GEYJ473V	47K 1/10	R353	ERDS2TJ123	12K 1/4
R116	ERJ6GEYJ182V	1.8K 1/10	R187	ERJ6GEYJ473V	47K 1/10	R354	ERDS2TJ274	270K 1/4
R117	ERJ6GEYJ182V	1.8K 1/10	R188	ERJ6GEYJ473V	47K 1/10	R355	ERDS2TJ333	33K 1/4
R118	ERJ6GEYJ102V	1K 1/10	R189	ERJ6GEYJ123	12K 1/10	R356	ERDS2TJ333	33K 1/4
R119	ERJ6GEYJ471V	470 1/10	R190	ERJ6GEYJ123	12K 1/10	R357	ERDS2TJ8R2	8.2 1/4
R120	ERJ6GEYJ120V	12 1/10	R191	ERJ6GEYJ154V	150K 1/10	R401	ERDS2TJ221	220 1/4
R122	ERJ6GEYJ471V	470 1/10	R192	ERJ6GEYJ824V	820K 1/10	R402	ERDS2TJ221	220 1/4
R123	ERJ6GEYJ393V	39K 1/10	R193	ERJ6GEYJ101V	100 1/10	R403	ERDS2TJ221	220 1/4
R141	ERJ6GEYJ102V	1K 1/10	R194	ERJ6GEYJ683V	68K 1/10	R404	ERDS2TJ221	220 1/4
R142	ERJ6GEYJ333V	33K 1/10	R195	ERJ6GEYJ103V	10K 1/10	R405	ERDS2TJ221	220 1/4
R143	ERJ6GEYJ124V	120K 1/10	R196	ERJ6GEYJ103V	10K 1/10	R406	ERDS2TJ221	220 1/4
R144	ERJ6GEYJ333V	33K 1/10	R197	ERJ6GEYJ473V	47K 1/10	R407	ERDS2TJ221	220 1/4
R145	ERJ6GEYJ153V	15K 1/10	R198	ERJ6GEYJ393V	39K 1/10	R408	ERDS2TJ221	220 1/4
R146	ERJ6GEYJ122	1.2K 1/10	R199	ERJ6GEYJ473V	47K 1/10	R409	ERDS2TJ472	4.7K 1/4
R147	ERJ6GEYJ682V	6.8K 1/10	R201	ERJ6GEYJ102V	1K 1/10	R410	ERDS2TJ472	4.7K 1/4
			R202	ERJ6GEYJ103V	10K 1/10	R411	ERDS2TJ472	4.7K 1/4
			R204	ERJ6GEYJ682V	6.8K 1/10	R412	ERDS2TJ472	4.7K 1/4

Ref. No.	Part No.	Value.
R413	ERDS2TJ472	4.7K 1/4
R414	ERDS2TJ472	4.7K 1/4
R415	ERDS2TJ472	4.7K 1/4
R416	ERDS2TJ472	4.7K 1/4
R417	ERDS2TJ472	4.7K 1/4
R418	ERDS2TJ472	4.7K 1/4
R419	ERDS2TJ472	4.7K 1/4
R420	ERDS2TJ472	4.7K 1/4
R421	ERDS2TJ913T	91K 1/4
R422	ERDS2TJ913T	91K 1/4
R423	ERDS2TJ124	120K 1/4
R424	ERDS2TJ124	120K 1/4
R425	ERDS2TJ101	100 1/4
R426	ERDS2TJ101	100 1/4
R427	ERDS2TJ223	22K 1/4
R429	ERDS2TJ472	4.7K 1/4
R431	ERDS2TJ472	4.7K 1/4
R432	ERDS2TJ101	100 1/4
R433	ERDS2TJ153	15K 1/4
R434	ERDS2TJ393	39K 1/4
R435	ERDS2TJ102	1K 1/4
R438	ERDS2TJ100	10 1/4
R440	ERDS2TJ102	1K 1/4
R442	ERDS2TJ102	1K 1/4
R443	ERDS2TJ102	1K 1/4
R501	ERJ6GEYJ104V	100K 1/10
R502	ERJ6GEYJ562V	5.6K 1/10
R503	ERJ6GEYJ474V	470K 1/10
R504	ERJ6GEYJ101V	100 1/10
R505	ERJ6GEYJ104V	100K 1/10
R506	ERJ6GEYJ333V	33K 1/10
R507	ERJ6GEYJ102V	1K 1/10
R601	ERDS2TJ104	100K 1/4
R602	ERDS2TJ472	4.7K 1/4
R603	ERDS2TJ472	4.7K 1/4
R604	ERDS2TJ472	4.7K 1/4
R605	ERDS2TJ472	4.7K 1/4
R606	ERDS2TJ472	4.7K 1/4
R607	ERDS2TJ472	4.7K 1/4
R617	ERDS2TJ103	10K 1/4
R801	ERDS2TJ103	10K 1/4
R802	ERDS2TJ103	10K 1/4
R803	ERDS2TJ103	10K 1/4
R804	ERDS2TJ103	10K 1/4
R805	ERDS2TJ223	22K 1/4
R806	ERDS2TJ223	22K 1/4
R807	ERDS2TJ223	22K 1/4
R808	ERDS2TJ223	22K 1/4
R809	ERDS2TJ473	47K 1/4
R810	ERDS2TJ473	47K 1/4
R811	ERDS2TJ473	47K 1/4
R812	ERDS2TJ473	47K 1/4
R813	ERDS2TJ221	220 1/4
R814	ERDS2TJ221	220 1/4
R815	ERDS2TJ474	470K 1/4
R816	ERDS2TJ474	470K 1/4
R817	ERDS2TJ104	100K 1/4
R818	ERDS2TJ104	100K 1/4
R819	ERDS2TJ681	680 1/4
R820	ERDS2TJ681	680 1/4
R821	ERDS2TJ473	47K 1/4
R822	ERDS2TJ473	47K 1/4
R823	ERDS2TJ331	330 1/4
R825	ERDS2TJ273	27K 1/4
R826	ERDS2TJ273	27K 1/4
R827	ERDS2TJ223	22K 1/4
R828	ERDS2TJ223	22K 1/4
R829	ERDS2TJ124	120K 1/4
R830	ERDS2TJ124	120K 1/4
R831	ERDS2TJ472	4.7K 1/4
R833	ERDS2TJ102	1K 1/4
R834	ERDS2TJ102	1K 1/4
R835	ERDS2TJ124	120K 1/4
R836	ERDS2TJ124	120K 1/4
R837	ERDS2TJ560	56 1/4
R838	ERDS2TJ560	56 1/4
R839	ERDS2TJ561	560 1/4
R840	ERDS2TJ561	560 1/4
R841	ERDS2TJ105	1M 1/4
R842	ERDS2TJ105	1M 1/4
R843	ERDS2TJ331	330 1/4
R850	ERDS2TJ822	8.2K 1/4
R851	ERDS2TJ102	1K 1/4
R852	ERDS2TJ102	1K 1/4
R853	ERDS2TJ333	33K 1/4
R854	ERDS2TJ183	18K 1/4
R855	ERDS2TJ102	1K 1/4
R856	ERDS2TJ102	1K 1/4
R857	ERDS2TJ102	1K 1/4
R858	ERDS2TJ102	1K 1/4
R862	ERDS2TJ102	1K 1/4
CAPACITORS(VALUE,VOLTAGE)		
C1	ECKDKC103PF2	0.01 125
C10	ECEA1CU222	2200 16
C11	ECEA1CU222	2200 16
C13	ECEA1AU101	100 10
C14	ECEA1AU101	100 10
C15	ECEA0JU470	47 6.3
C16	ECEA1HU470	47 50
C17	ECEA1VU101	100 35
C19	ECBT1C103NS5	0.01 16
C20	ECEA1CU221	220 16
C30	ECBT1H102KB5	0.001 50
C31	ECBT1C103NS5	0.01 16
C32	ECBT1C103NS5	0.01 16
C101	RCUV1E104ZF	0.1 25
C102	RCUV1H102KB	0.001 50
C103	RCUV1H102KB	0.001 50
C104	RCUV1H681KB	680P 50
C105	RCUV1H471KB	470P 50
C106	RCUV1H471KB	470P 50
C107	RCUV1H220KC	22P 50
C108	ECEA1HKK0R1	0.1 50
C109	ECEA1HKK010	1 50
C110	ECQM1H104JZP	0.1 50
C111	ECEA1AKK100	10 10
C112	ECEA1AKK100	10 10
C113	ECEA1HSN010	1 50
C114	RCUV1H182KB	0.0018 50
C115	RCUV1H682KB	0.0068 50
C116	RCUV1E333KB	0.033 25
C117	RCUV1H221KB	220P 50
C118	ECEA1HKK010	1 50
C119	ECEA0JKS220	22 6.3
C120	RCUV1H681KB	680P 50
C121	RCUV1E103KB	0.01 25
C122	RCUV1H101KC	100P 50
C123	RCUV1H101KC	100P 50
C125	ECEA0JKS220	22 6.3
C126	ECEA0JKS470	47 6.3
C127	RCUV1H102KB	0.001 50
C128	RCUV1H102KB	0.001 50
C129	RCUV1H681KB	680P 50
C141	RCUV1E153KB	0.015 25
C142	RCUV1H122KB	0.0012 50
C143	ECUV1E473KB	0.047 25
C144	ECEA1VSN2R2	2.2 35
C145	ECEA1HSNR22	0.22 50
C161	RCUV1E153KB	0.015 25
C162	RCUV1H681KB	680P 50
C163	RCUV1E103KB	0.01 25
C164	ECEA1ESN3R3	3.3 25
C165	ECEA1HSN0R1	0.1 50
C181	ECQM1H474JZ	0.47 50
C182	RCUV1H221KB	220P 50
C183	RCUV1H682KB	0.0068 50
C184	ECEA1HSN010	1 50
C186	ECUV1C224KR	0.22 16
C201	RCUV1E103KB	0.01 25
C222	ECEA0JKA101	100 6.3
C223	ECEA0JKA101	100 6.3
C224	RCUV1E104ZF	0.1 25
C226	RCUV1E104ZF	0.1 25
C227	RCUV1E104ZF	0.1 25
C228	ECUV1E823KB	0.082 25
C230	ECUV1E473KB	0.047 25
C301	ECFR1E104ZF5	0.1 25
C302	ECBT1C103NS5	0.01 16
C303	ECFR1E104ZF5	0.1 25
C306	ECEA0JS331	330 6.3
C307	ECFR1E104ZF5	0.1 25
C308	ECFR1E104ZF5	0.1 25
C309	ECBT1C103NS5	0.01 16
C351	ECBT1H102KB5	0.001 50
C401	ECEA0JU470	47 6.3
C402	ECFR1E104ZF5	0.1 25
C403	ECFR1E104ZF5	0.1 25
C404	ECFR1E104ZF5	0.1 25
C405	ECBT1H102KB5	0.001 50
C406	ECBT1H102KB5	0.001 50
C407	ECEA1HN010	1 50
C409	ECBT1H102KB5	0.001 50
C414	ECBT1C103NS5	0.01 16
C416	ECBT1C103NS5	0.01 16
C420	ECBT1C103NS5	0.01 16
C421	ECBT1C103NS5	0.01 16
C422	ECBT1C103NS5	0.01 16
C501	ECUV1E104KB	0.1 25
C502	ECQM1H104JZP	0.1 50
C503	ECEA1AKK100	10 10
C504	RCUV1E104ZF	0.1 25
C505	RCUV1E104ZF	0.1 25
C506	RCUV1H150K	15P 50
C507	RCUV1H102KB	0.001 50
C508	ECEA1ASN100	10 10
C509	RCUV1H100DC	10P 50
C510	ECUV1E104KB	0.1 25
C511	ECEA1HKSR47	0.47 50
C512	RCUV1H681KB	680P 50
C513	RCUV1H681KB	680P 50
C514	ECUV1C224KR	0.22 16
C515	RCUV1E153KB	0.015 25
C516	ECEA1VSN2R2	2.2 35
C517	RCUV1H471KB	470P 50
C519	ECUV1C224KR	0.22 16
C520	RCUV1H472KB	0.0047 50
C601	RCBC1H101KBY	100P 50
C602	RCBC1H101KBY	100P 50
C603	RCBC1H101KBY	100P 50
C604	RCBC1H101KBY	100P 50
C801	ECBT1H680K5	68P 50
C802	ECBT1H680K5	68P 50
C803	ECBT1H680K5	68P 50
C804	ECBT1H680K5	68P 50
C805	ECBT1H470J5	47P 50
C806	ECBT1H470J5	47P 50
C807	ECBT1H470J5	47P 50
C808	ECBT1H470J5	47P 50
C809	ECEA1EN3R3S	3.3 25
C810	ECEA1EN3R3S	3.3 25
C811	ECBT1H102KB5	0.001 50
C812	ECBT1H102KB5	0.001 50
C813	ECEA1CN220S	22 16
C814	ECEA1CN220S	22 16
C815	ECBT1H102KB5	0.001 50
C816	ECBT1H102KB5	0.001 50
C817	ECEA1HN010	1 50
C818	ECEA1HN010	1 50
C819	ECBT1H470J5	47P 50
C820	ECBT1H470J5	47P 50
C822	ECBT1H5R6K5	5.6P 50
C824	ECBT1H5R6K5	5.6P 50
C840	ECFR1E104ZF5	0.1 25
C841	ECEA0JS331	330 6.3
C851	ECEA0JU471	470 6.3
C852	ECEA0JS331	330 6.3
C853	ECEA1CN100S	10 16
C854	ECFR1E104ZF5	0.1 25
C855	ECFR1E104ZF5	0.1 25
C856	ECFR1E104ZF5	0.1 25
C857	ECFR1E104ZF5	0.1 25
C858	ECFR1E104ZF5	0.1 25
C859	ECEA0JS331	330 6.3
C863	ECEA1HU3R3	3.3 50
C901	ECFTD103KXL	0.01 25
C902	ECFTD103KXL	0.01 25
C903	ECFTD103KXL	0.01 25
C904	ECCD1H680KC	68P 50

■ REMOTE-CONTROL UNIT PARTS



■ REPLACEMENT PARTS LIST

Ref. No.	Part No.	Description
REMOTE CONTROL		
INTEGRATED CIRCUITS		
IC1	MN6030B	I.C
TRANSISTORS		
Q1	UN1231	TRANSISTOR
DIODES		
D1	LN66-S	L.E.D
COIL		
D2, D3	MA154WK	DIODE
D4, D5	MA154WK	DIODE
D6, D7	MA154WA	DIODE
OSCILLATOR		
X1	CSB420PB1	OSCILLATOR

Ref. No.	Part No.	Description
RESISTORS		
R1	ERDS2TJ1R0	CARBON, 1Ω, 1/4W
CAPACITORS		
C1	ECKD1H471KB	CERAMIC, 470PF, 50V
C2	ECKD1H121KB	CERAMIC, 120PF, 50V
C3	ECEA0GK101	ELECTROLYTIC, 100μF, 4V
MECHANISM PARTS		
1	UR64VCS571	UPPER CABINET
2	UR64CS803A	LOWER CABINET
3	UR64EC804	BATTERY COVER
4	UR64CT811F	BUTTON
5	UR52SB327	PLATE
6	UR64TD374	BATTERY TERMINAL(COMMON)
7	UR64TD813	BATTERY TERMINAL(-)
8	UR64TD812	BATTERY TERMINAL(+)
REMOTE CONTROL ASS'Y		
RC1	EUR64790	REMOTE CONTROLLER

E POWER SUPP

AC OUTL

*Except (XL)a

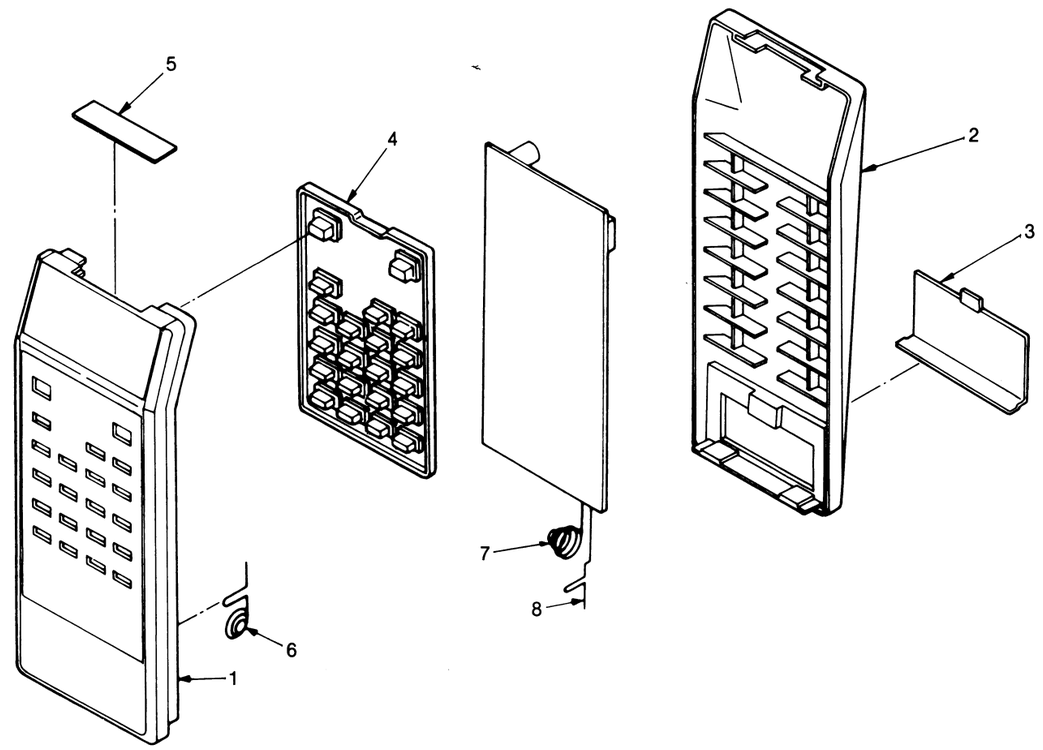
To Servo Gain Adjuster

F HEA

No.	Value.
04ZF	0.1 25
23KB	0.082 25
73KB	0.047 25
04ZF5	0.1 25
03NS5	0.01 16
04ZF5	0.1 25
3331	330 6.3
04ZF5	0.1 25
04ZF5	0.1 25
03NS5	0.01 16
02KB5	0.001 50
J470	47 6.3
04ZF5	0.1 25
04ZF5	0.1 25
04ZF5	0.1 25
02KB5	0.001 50
02KB5	0.001 50
J010	1 50
02KB5	0.001 50
03NS5	0.01 16
03NS5	0.01 16
03NS5	0.01 16
03NS5	0.01 16
03NS5	0.01 16
04KB	0.1 25
04JZP	0.1 50
EK100	10 10
04ZF	0.1 25
04ZF	0.1 25
50K	15P 50
02KB	0.001 50
EN100	10 10
00DC	10P 50
04KB	0.1 25
SR47	0.47 50
81KB	680P 50
81KB	680P 50
24KR	0.22 16
53KB	0.015 25
N2R2	2.2 35
71KB	470P 50
24KR	0.22 16
72KB	0.0047 50
01KBY	100P 50
01KBY	100P 50
80K5	68P 50
80K5	68P 50
80K5	68P 50
80K5	68P 50
70J5	47P 50
70J5	47P 50
70J5	47P 50
70J5	47P 50
3R3S	3.3 25
3R3S	3.3 25
02KB5	0.001 50
02KB5	0.001 50
220S	22 16
220S	22 16
02KB5	0.001 50
02KB5	0.001 50
J010	1 50
J010	1 50
70J5	47P 50
70J5	47P 50
R6K5	5.6P 50
R6K5	5.6P 50
04ZF5	0.1 25
3331	330 6.3
J471	470 6.3
3331	330 6.3
100S	10 16
04ZF5	0.1 25
04ZF5	0.1 25
04ZF5	0.1 25

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
C857	ECFR1E104ZF5	0.1 25	C859	ECEA0JS331	330 6.3	C901	ECFTD103KXL	0.01 25
C858	ECFR1E104ZF5	0.1 25	C863	ECEA1HU3R3	3.3 50	C902	ECFTD103KXL	0.01 25
						C903	ECFTD103KXL	0.01 25
						C904	ECCD1H680KC	68P 50

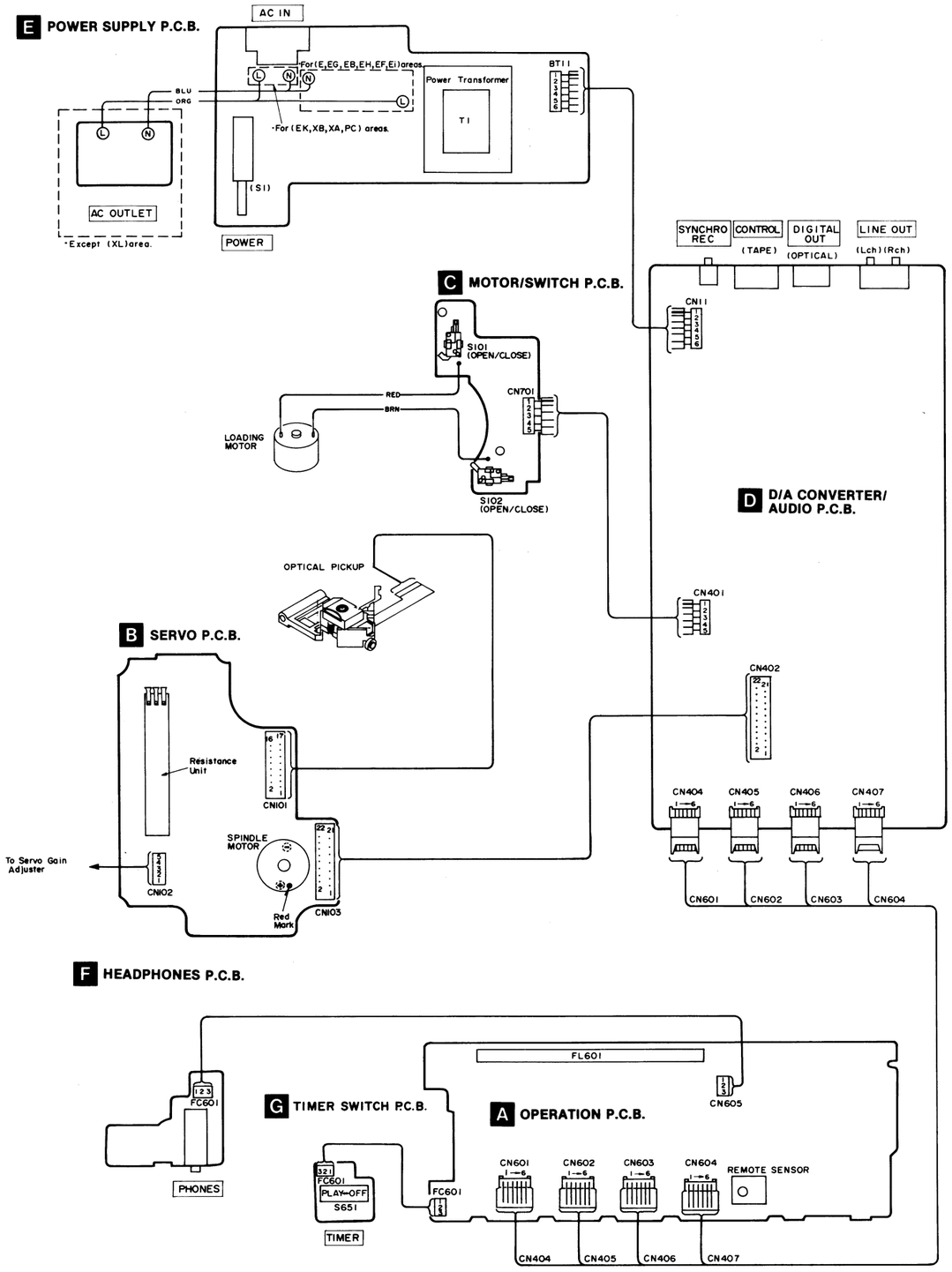
■ REMOTE-CONTROL UNIT PARTS



■ REPLACEMENT PARTS LIST

Ref. No.	Part No.	Description
REMOTE CONTROL		
INTEGRATED CIRCUITS		
IC1	MN6030B	I.C
TRANSISTORS		
Q1	UN1231	TRANSISTOR
DIODES		
D1	LN66-S	L.E.D
COIL		
D2, D3	MA154WK	DIODE
D4, D5	MA154WK	DIODE
D6, D7	MA154WA	DIODE
OSCILLATOR		
X1	CSB420PB1	OSCILLATOR

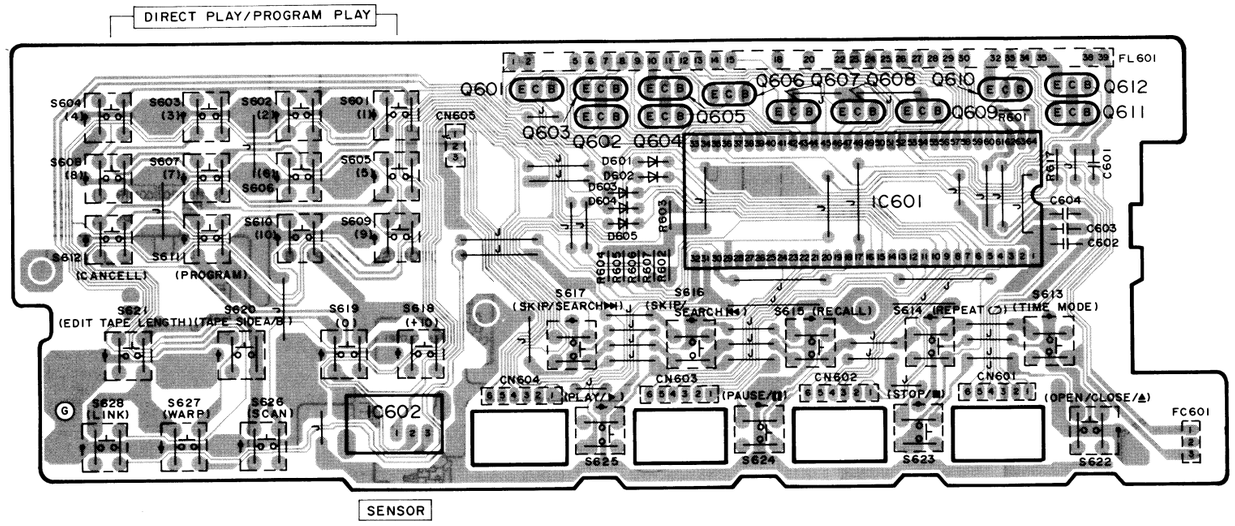
Ref. No.	Part No.	Description
RESISTORS		
R1	ERDS2TJ1R0	CARBON, 1Ω, 1/4W
CAPACITORS		
C1	ECKD1H471KB	CERAMIC, 470PF, 50V
C2	ECKD1H121KB	CERAMIC, 120PF, 50V
C3	ECEA0GK101	ELECTROLYTIC, 100μF, 4V
MECHANISM PARTS		
1	UR64VCS571	UPPER CABINET
2	UR64CS803A	LOWER CABINET
3	UR64EC804	BATTERY COVER
4	UR64CT811F	BUTTON
5	UR52SB327	PLATE
6	UR64TD374	BATTERY TERMINAL(COMMON)
7	UR64TD813	BATTERY TERMINAL(-)
8	UR64TD812	BATTERY TERMINAL(+)
REMOTE CONTROL ASS'Y		
RC1	EUR64790	REMOTE CONTROLLER



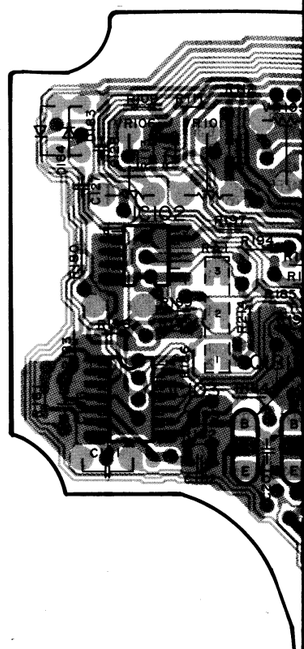
SL-PJ45 SL-PJ45

■PRINTED CIRCUIT BOARDS

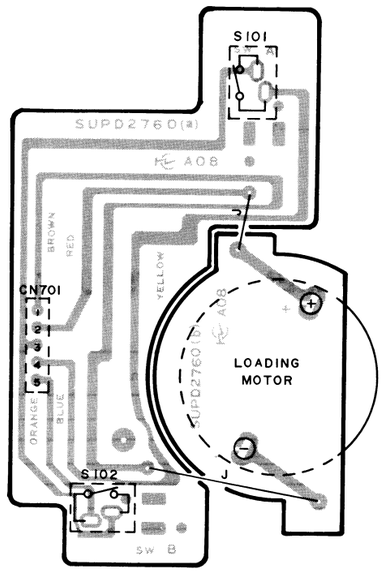
A OPERATION P.C.B



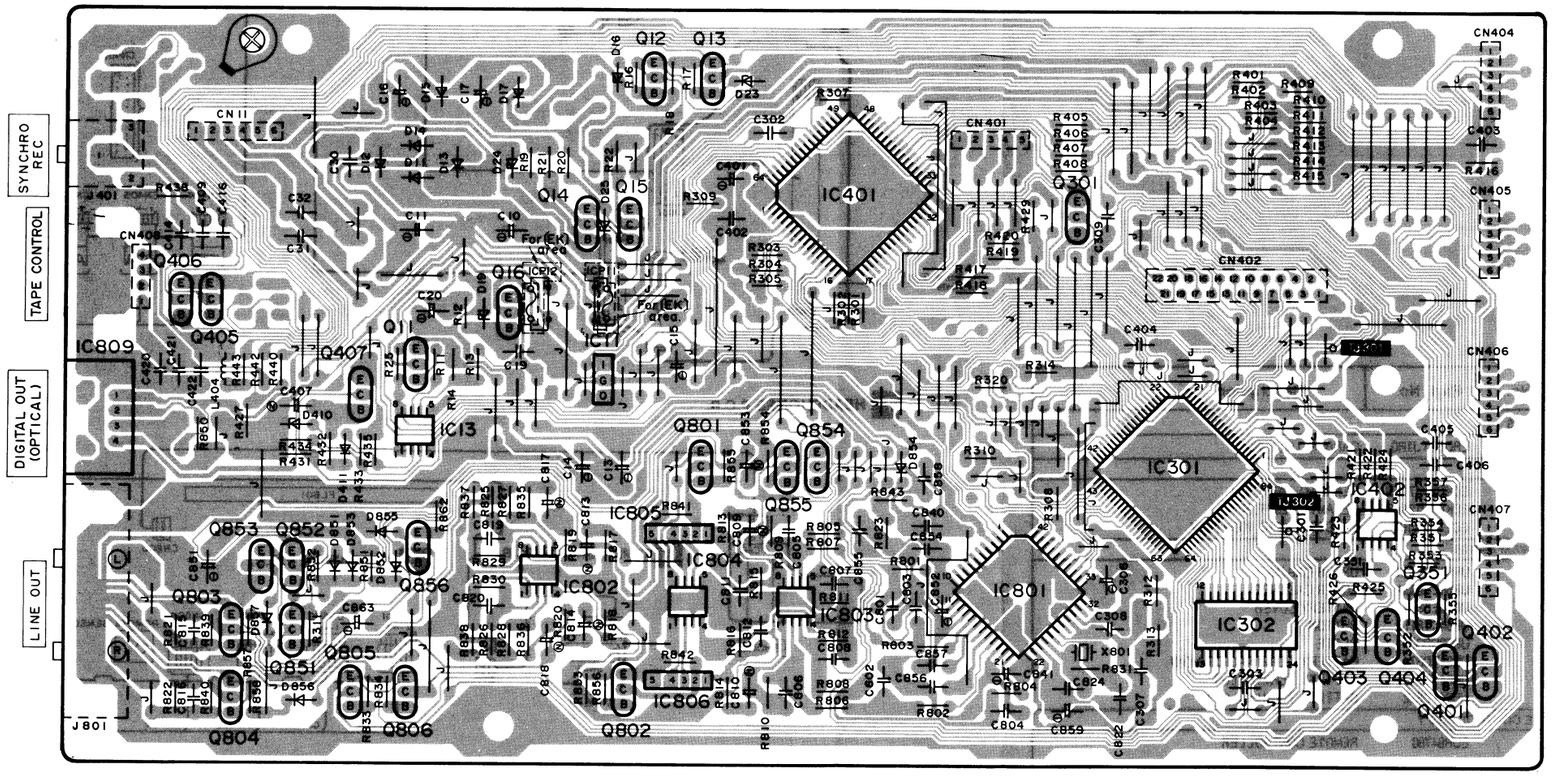
B SERVO P.C.B.



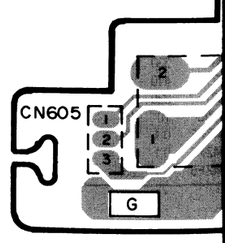
C MOTOR/SWITCH P.C.B.

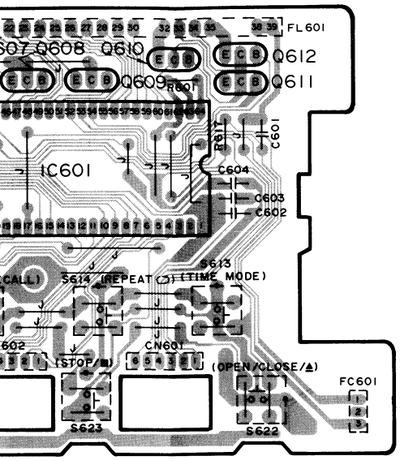


D D/A CONVERTER/AUDIO P.C.B.

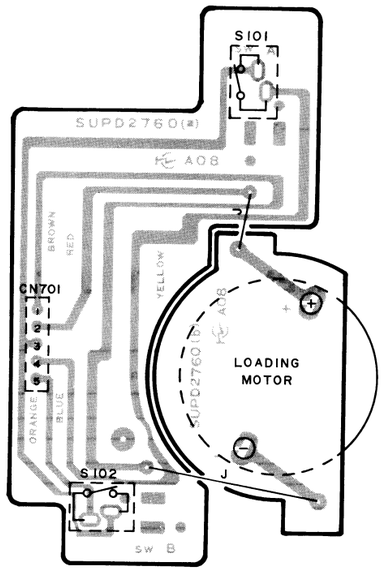


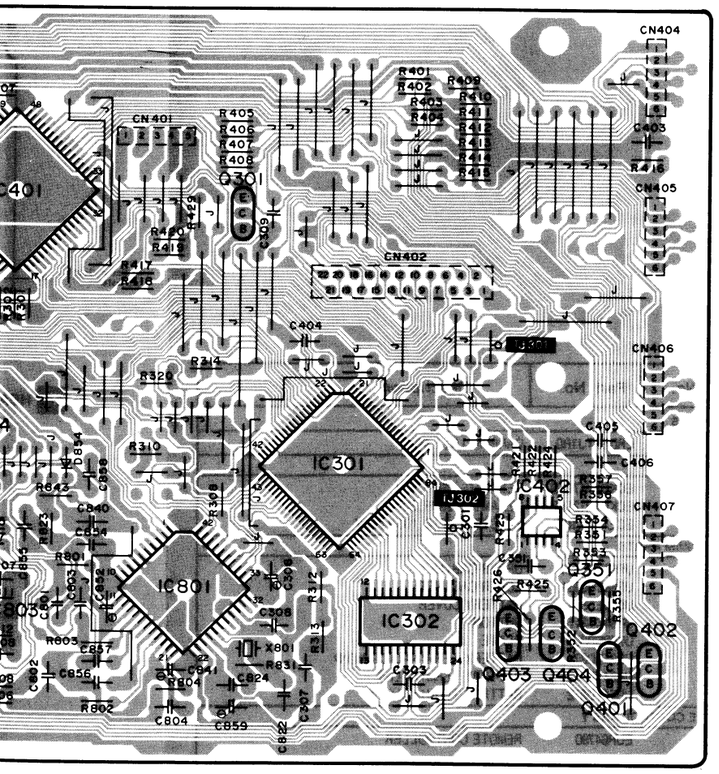
F HEADPHON





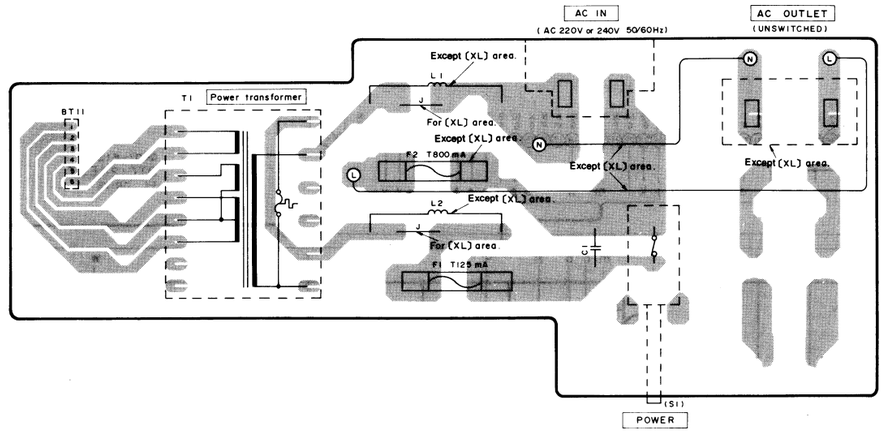
C MOTOR/SWITCH P.C.B.





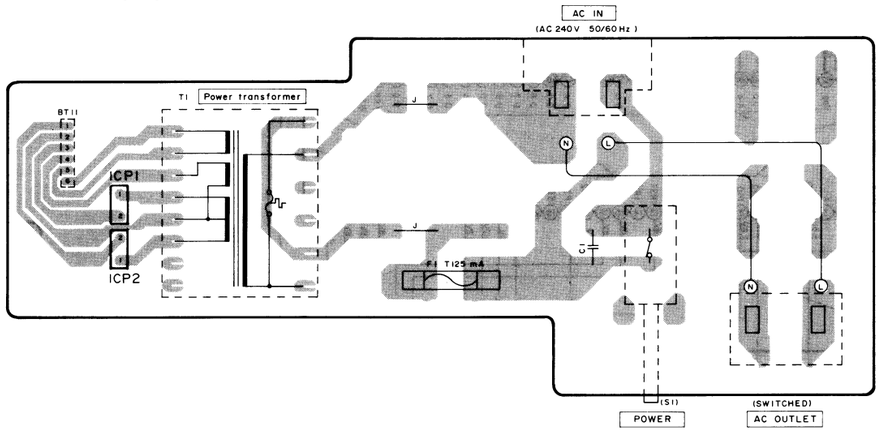
E POWER SUPPLY P.C.B.

• For (E), (EG), (EB), (EH), (EF), (Ei) and (XL) areas.



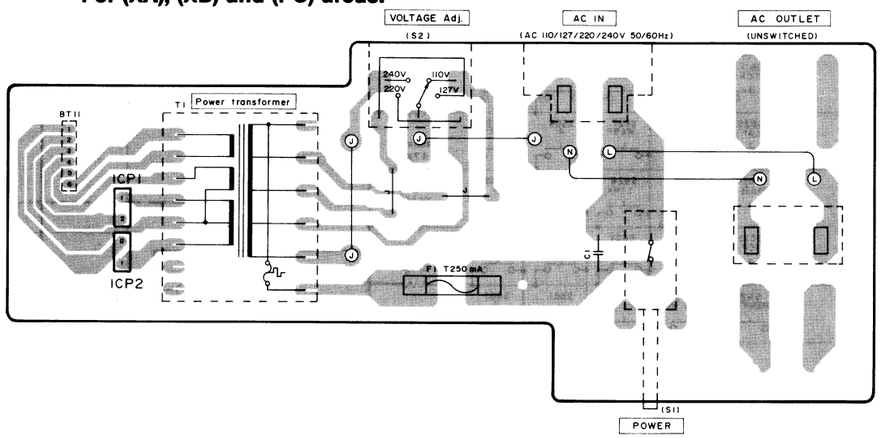
E POWER SUPPLY P.C.B.

• For (EK) area.

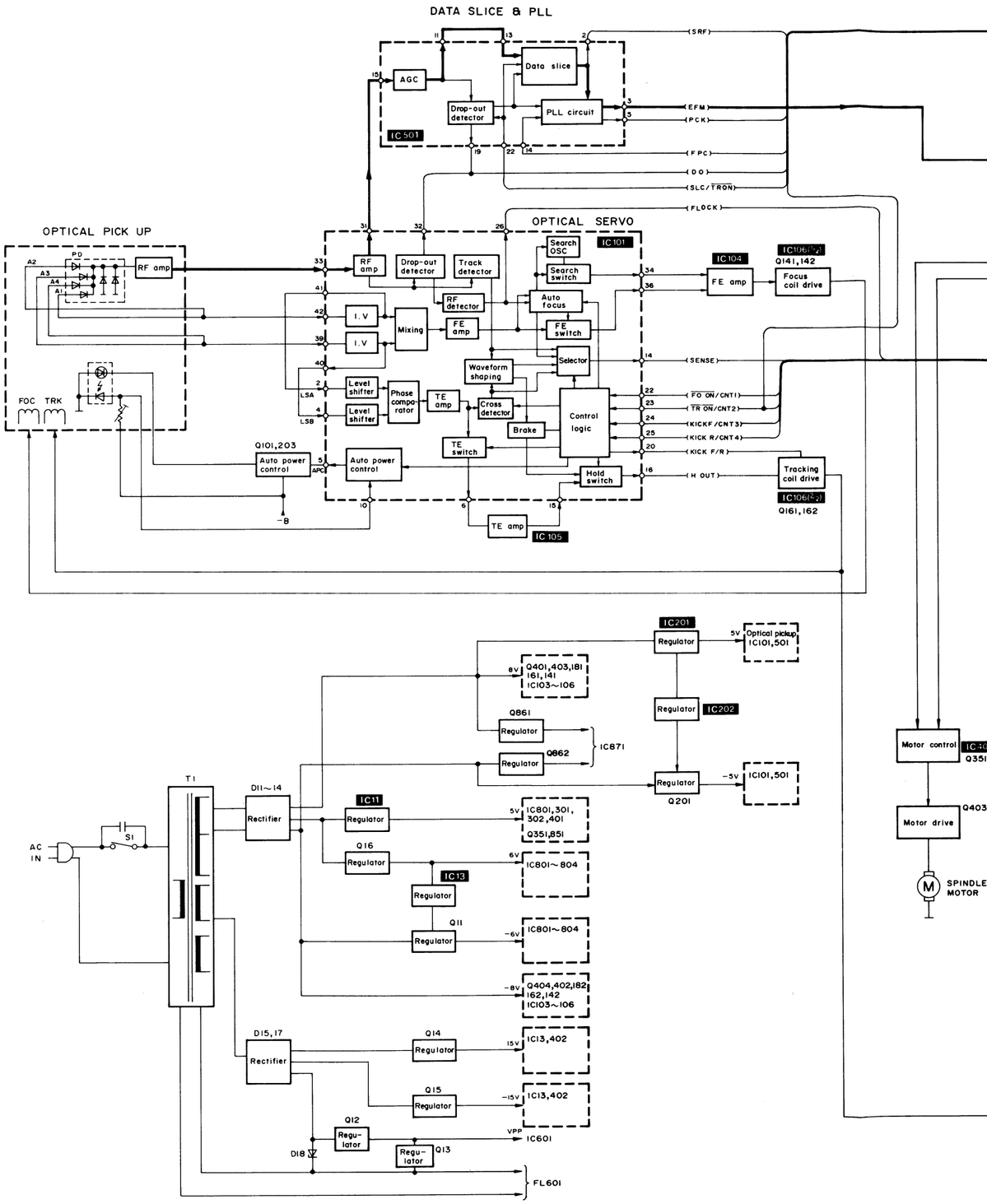


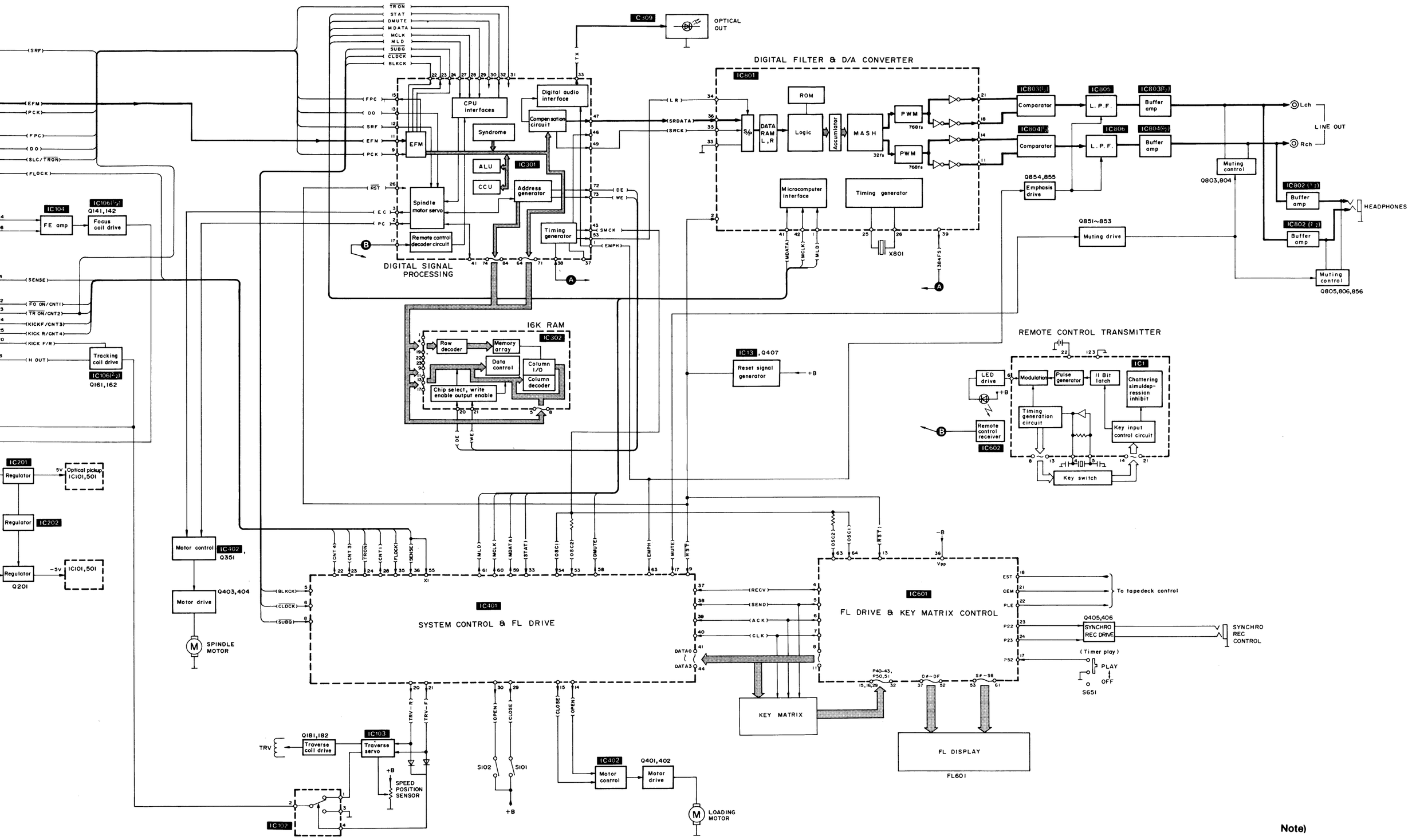
E POWER SUPPLY P.C.B.

• For (XA), (XB) and (PC) areas.

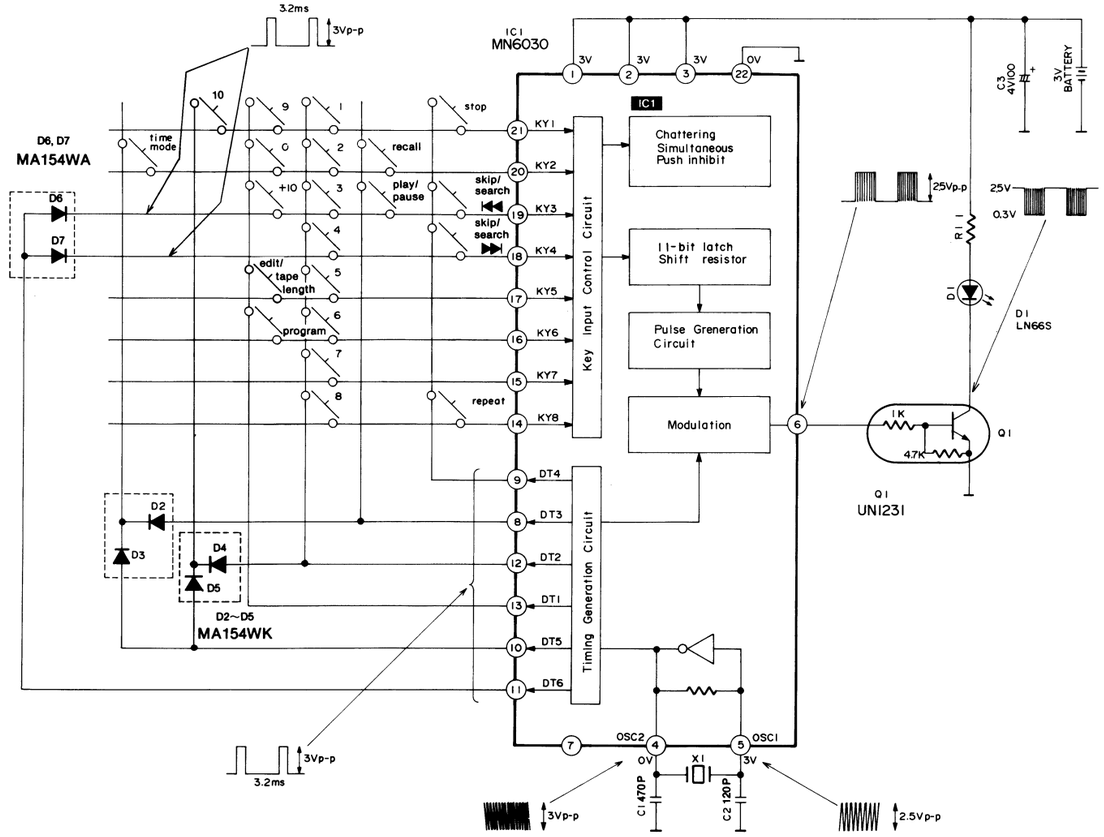


■ BLOCK DIAGRAM

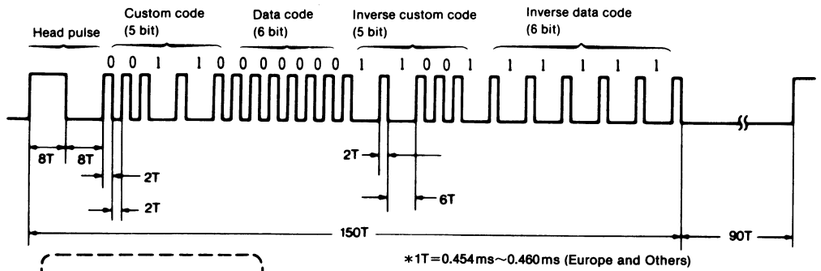


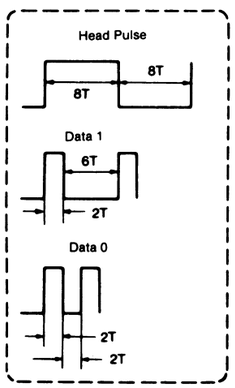

DIGITAL FILTER & D/A CONVERTER
IC801
ROM
Logic
Accumulator
MASH
DATA RAM L,R
PWM
768fs
32fs
Comparator
L.P.F.
Buffer amp
Lch
Rch
LINE OUT
Muting control
Q803,804
Emphasis drive
Q854,855
Microcomputer interface
Timing generator
X801
Muting drive
Q851~853
HEADPHONES
Muting control
Q805,806,856
C309
OPTICAL OUT
DIGITAL SIGNAL PROCESSING
IC301
CPU interfaces
Digital audio interface
Compensation circuit
Syndrome
EFM
ALU
CCU
Address generator
Spindle motor servo
Remote control decoder circuit
Timing generator
16K RAM
IC302
Row decoder
Memory array
Data control
Column I/O
Column decoder
Chip select, write enable output enable
REMOTE CONTROL TRANSMITTER
IC1
LED drive
Modulation
Pulse generator
11 Bit latch
Chattering simuldep-ression inhibit
Timing generation circuit
Key input control circuit
Key switch
Remote control receiver
IC602
IC13, Q407
Reset signal generator
+B
IC201
Regulator
5V
Optical pickup IC101,501
Regulator
IC202
Regulator
-5V
IC101,501
Q201
Motor control IC402, Q351
Motor drive
Q403,404
SPINDLE MOTOR
IC104
FE amp
IC106(F,)
Q141,142
Focus coil drive
IC106(R,)
Q161,162
Tracking coil drive
IC103
Traverse servo
Q181,182
Traverse coil drive
TRV
IC102
SPEED POSITION SENSOR
SW02
SW01
IC402
Motor control
Q401,402
Motor drive
LOADING MOTOR
SYSTEM CONTROL & FL DRIVE
IC401
FL DRIVE & KEY MATRIX CONTROL
IC601
KEY MATRIX
FL DISPLAY
FL601
To tapedeck control
Q405,406
SYNCHRO REC DRIVE
SYNCHRO REC CONTROL
(Timer play)
PLAY
OFF
S651
Note)
Audio signal

■ SCHEMATIC DIAGRAM OF REMOTE-CONTROL TRANSMITTER



• Key number description and data code





Function	Data Code
■ stop	000000
⏮ skip/ search	000010
⏭ skip/ search	000011
repeat	000111
⏯ play/ pause	001010

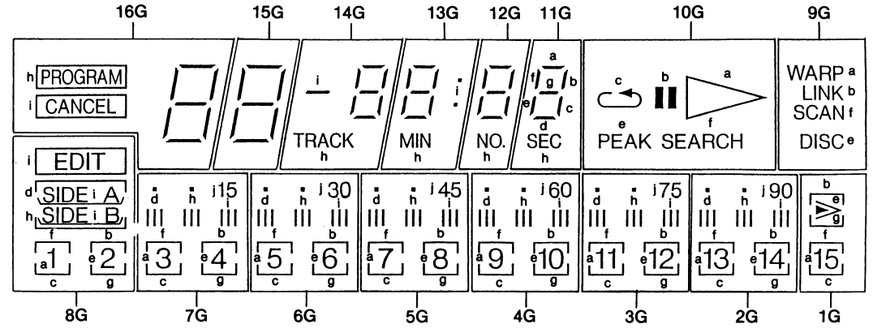
Function	Data Code
1	010000
2	010001
3	010010
4	010011
5	010100
6	010101
7	010110
8	010111

Function	Data Code
9	011000
0	011001
+10	011010
edit/tape length	011100
program	011101
time mode	101001
10	110000

*Custom Code: 01100

■ INTERNAL CONNECTION OF FL

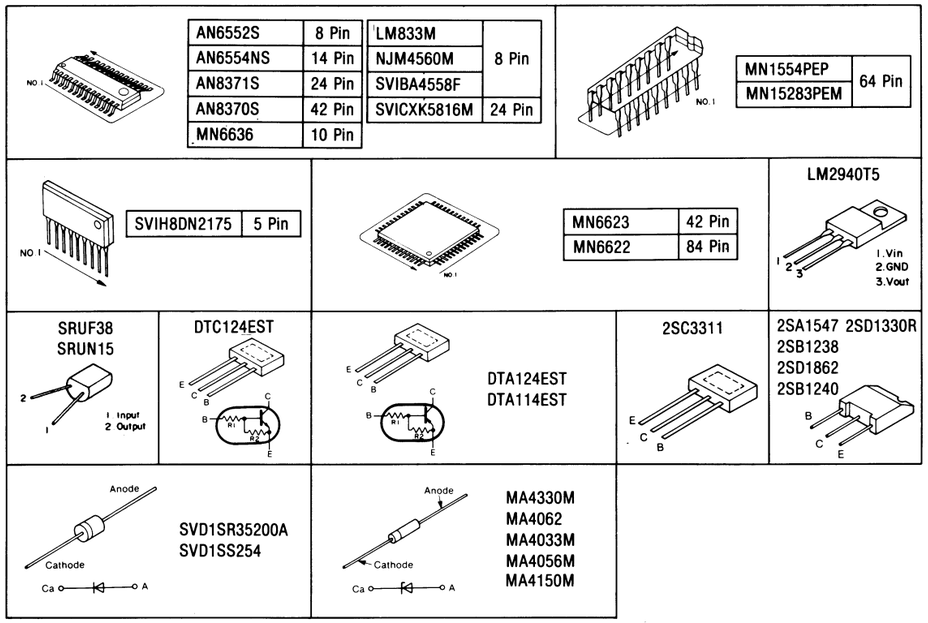
• Grid connection diagram

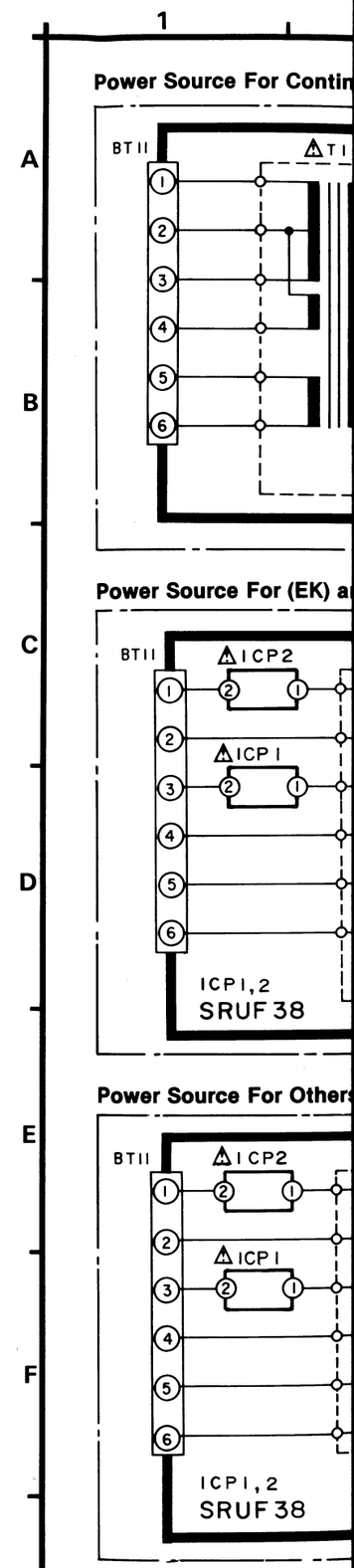


• Anode connection table

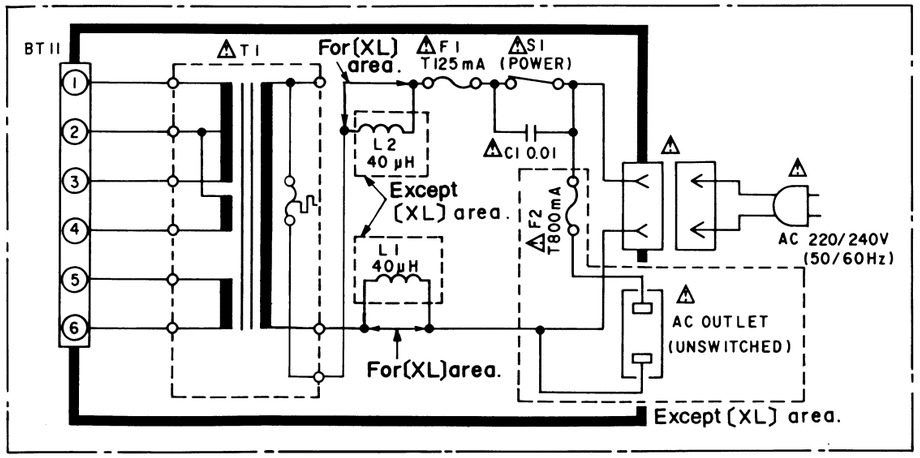
	16G	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	a	a	a	a	a	a	a	WARP	1	3	5	7	9	11	13	15
b	b	b	b	b	b	b	b	LINK	2	4	6	8	10	12	14	▶
c	c	c	c	c	c	c	↺	–	1	3	5	7	9	11	13	15
d	d	d	d	d	d	d	–	–								–
e	e	e	e	e	e	e	PEAK	DISC	2	4	6	8	10	12	14	▶
f	f	f	f	f	f	f	SEARCH	SCAN	1	3	5	7	9	11	13	15
g	g	g	g	g	g	g	–	–	2	4	6	8	10	12	14	▶
h	PROGRAM	–	TRACK	MIN	NO.	SEC	–	–								–
i	CANCEL	–	—	:	–	–	–	–	SIDE A SIDE B EDIT							–
j	–	–	–	–	–	–	–	–	–	■ ■ 15	■ ■ 30	■ ■ 45	■ ■ 60	■ ■ 75	■ ■ 90	–

■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

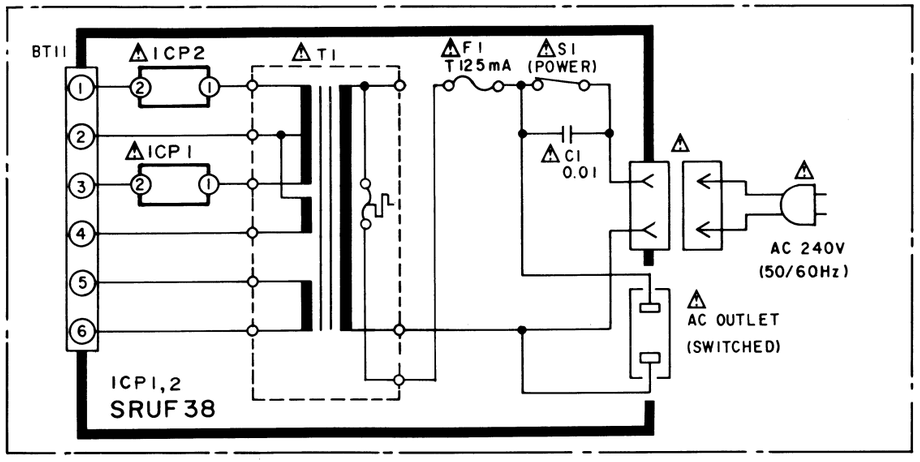




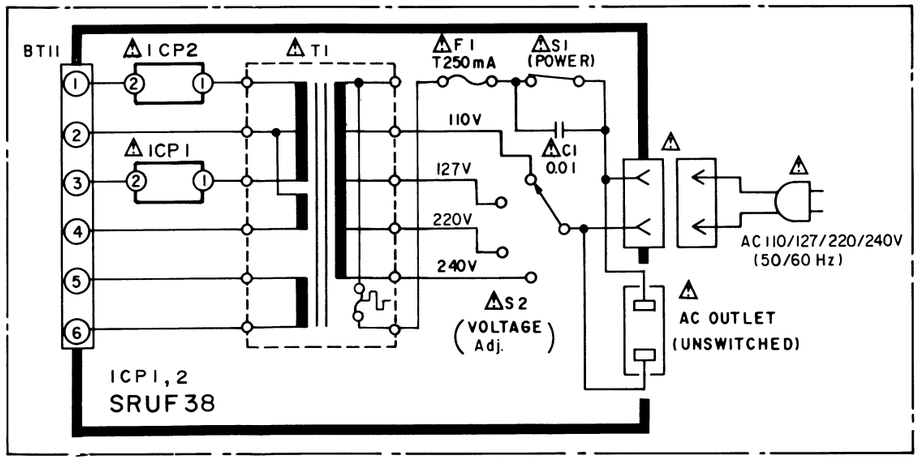
Power Source For Continental Europe and Australia.



Power Source For (EK) area.

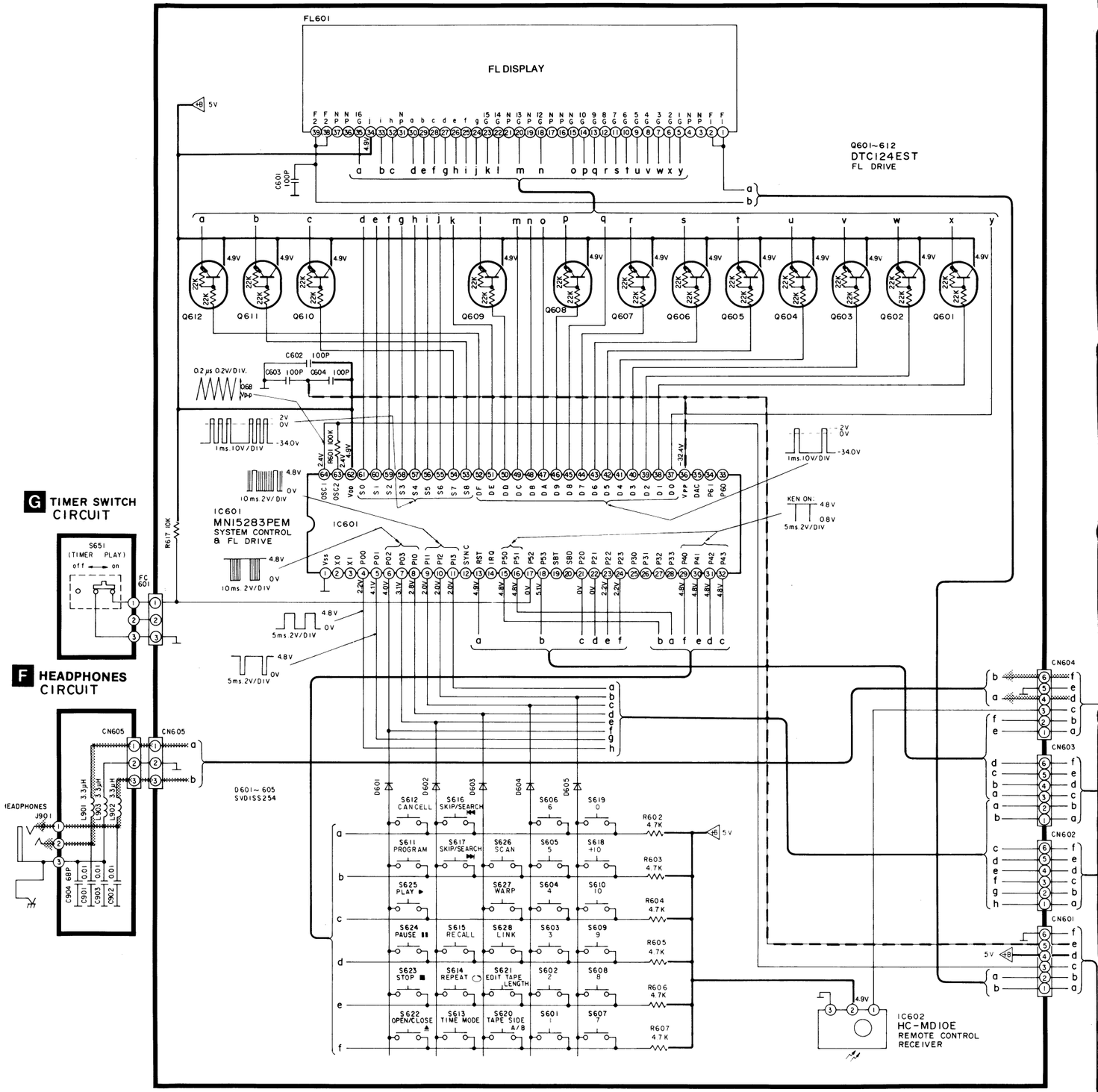


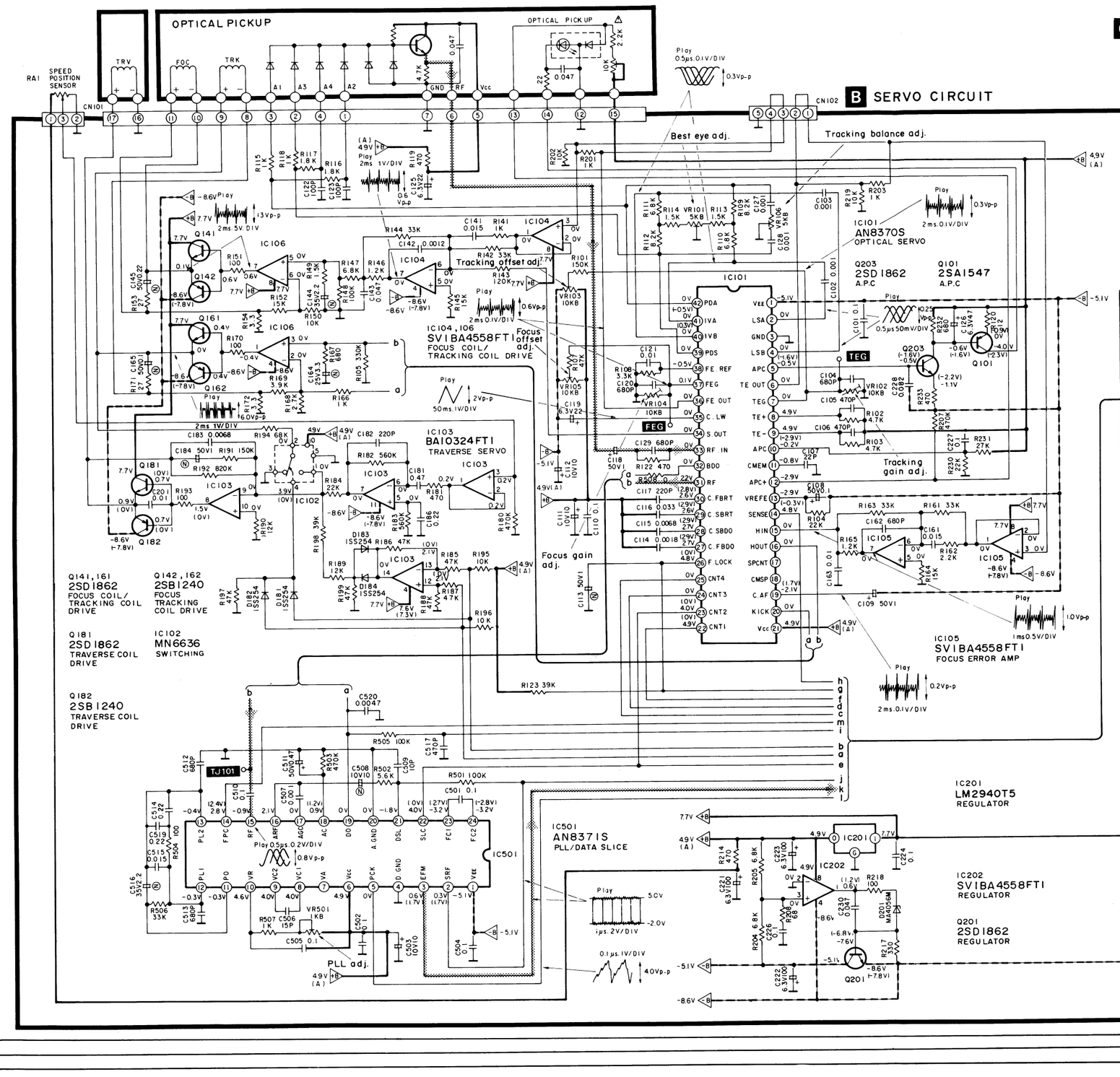
Power Source For Others.

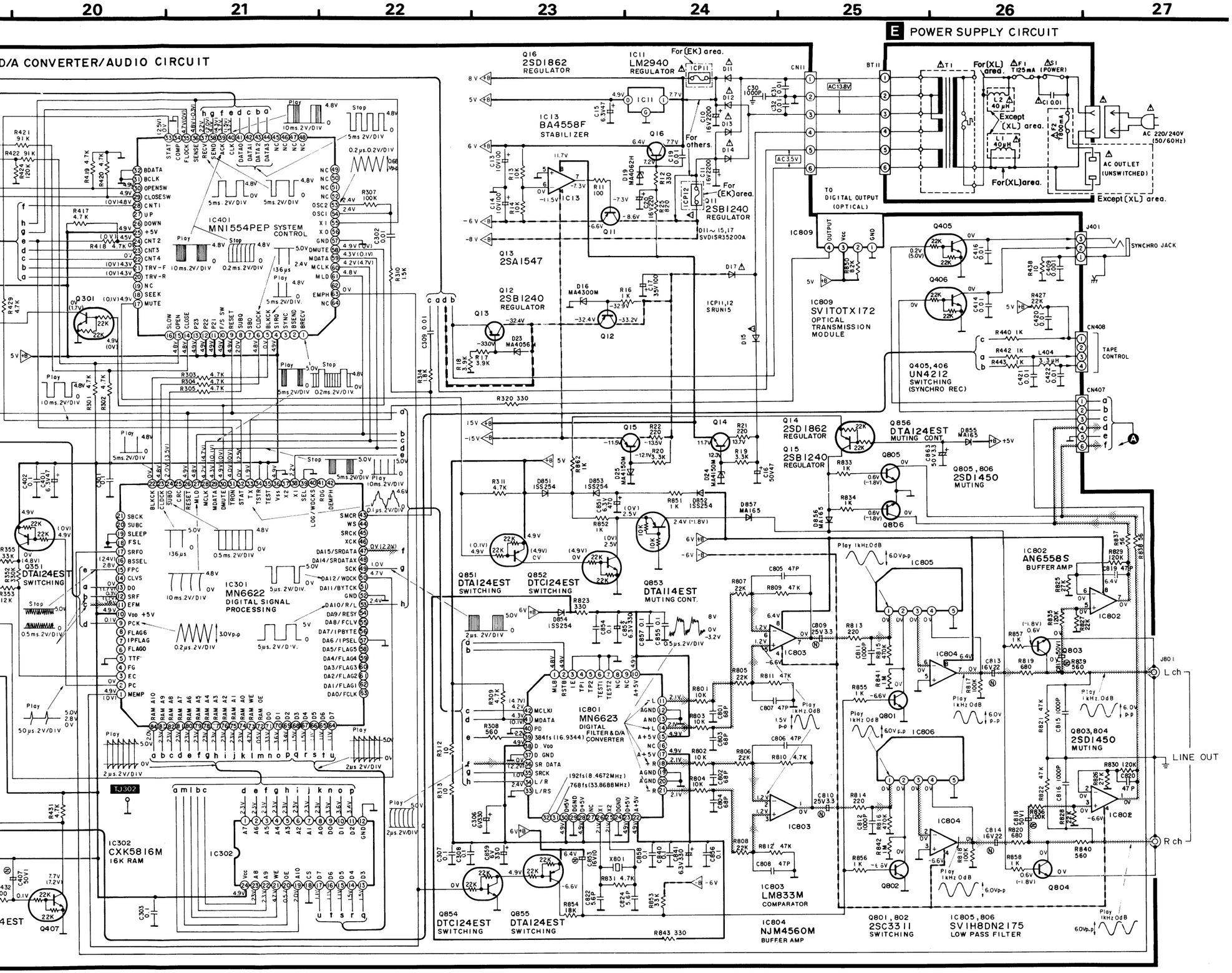


G TIMER SWITCH CIRCUIT

F HEADPHONES CIRCUIT




OPTICAL PICKUP
OPTICAL PICKUP
SPEED POSITION SENSOR
RA1
CN101
TRV
FOC
TRK
A1
A3
A4
A2
GND
RF
Vcc
CN102
B SERVO CIRCUIT
Best eye adj.
Tracking balance adj.
IC101
AN8370S
OPTICAL SERVO
Q203
2SD1862
A.P.C
Q101
2SA1547
A.P.C
TEG
FEG
Tracking gain adj.
Tracking offset adj.
Focus offset adj.
IC104, 106
SVIBA4558FTI
FOCUS COIL/
TRACKING COIL DRIVE
IC103
BA10324FTI
TRAVERSE SERVO
Focus gain adj.
PLL adj.
Q141, 161
2SD1862
FOCUS COIL/
TRACKING COIL
DRIVE
Q142, 162
2SB1240
FOCUS
TRACKING
COIL DRIVE
Q181
2SD1862
TRAVERSE COIL
DRIVE
IC102
MN6636
SWITCHING
Q182
2SB1240
TRAVERSE COIL
DRIVE
IC105
SVIBA4558FTI
FOCUS ERROR AMP
IC201
LM2940T5
REGULATOR
IC202
SVIBA4558FTI
REGULATOR
Q201
2SD1862
REGULATOR
IC501
AN8371S
PLL/DATA SLICE
TJ101
C MOTOR/ SWITCH CIRCUIT
LOADING MOTOR
SI01
SI02
OPEN/CLOSE DETECTOR
CN701
CN401
CN103
CN402
SPINDOL MOTOR
D D/A CONVERTER/AUDIO CIRCUIT
Q401
2SD1862
MOTOR DRIVE
Q402
2SB1240
MOTOR DRIVE
IC402
BA4558F
MOTOR DRIVE
Q301
DTC124EST
SWITCHING
Q403
2SD1862
MOTOR DRIVE
Q404
2SB1240
MOTOR DRIVE
TJ301
IC402
Q403
Q404
Q351
DTA124EST
SWITCHING
IC401
MN1554PE
IC301
MN6622
DIGITAL PROCESS
CN406
CN405
CN404
IC13
SVIBA4558F
STABILIZER
IC302
CXK5816M
16K RAM
TJ302
Q407
DTC124EST
RESET



■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with development of new technology.)

Notes:

- **S1** : Power switch in "**on**" position.
- **S2** : Voltage selector switch. (For [XA], [XB] and [PC] only.)
- **S101** : Disc holder open/close detection switch.
- **S102** : Disc holder open/close detection switch.
- **S601~610, 618, 619** : Numeric switch. [S601: 1, S602: 2, S603: 3, S604: 4, S605: 5, S606: 6, S607: 7, S608: 8, S609: 9, S610: 10, S618: +10, S619: 0]
- **S611** : Programmed-play switch.
- **S612** : Cancel switch.
- **S613** : Time-mode select switch.
- **S614** : Repeat switch.
- **S615** : Recall switch.
- **S616** : Forward skip/search switch.
- **S617** : Backward skip/search switch.
- **S620** : Tape-side select switch.
- **S621** : Compact-disc edit switch.
- **S622** : Disc tray open/close switch.
- **S623** : Stop switch.
- **S624** : Pause switch.
- **S625** : Play switch.
- **S626** : Music scan switch.
- **S627** : Warp switch.
- **S628** : Link switch.
- **S651** : Timer stand-by switch.
- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
  * The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- —□—/--□--- : Positive voltage lines and negative voltage lines.
  ▒▒▒ : Audio signal lines.

Caution !

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

■ REPLACEMENT PARTS LIST (Mechanical parts)

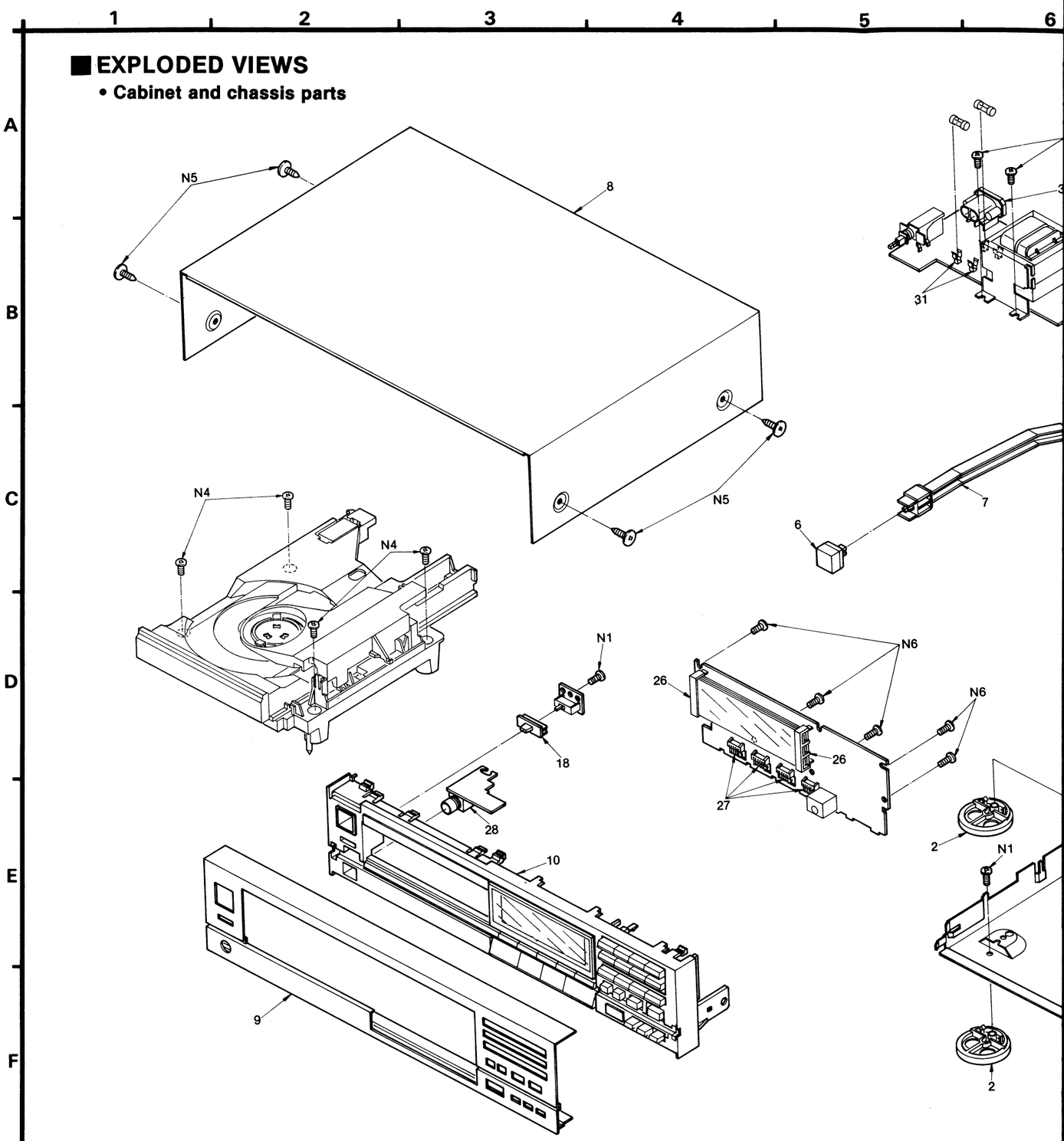
Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Description
CABINET AND CHASSIS		
1 (E)	SGPD750ZF0A	REAR PANEL
1 (EK)	SGPD750ZF1A	REAR PANEL
1 (XL)	SGPD750ZF2A	REAR PANEL
1 (XB)	SGPD750ZF3A	REAR PANEL
1 (XA)	SGPD750ZF4A	REAR PANEL
1 (PC)	SGPLPJ45-KC	REAR PANEL
1 (EG)	SGPLPJ45-KG	REAR PANEL
1 (EH, EB, EF) (EI)	SGPLPJ45-KH	REAR PANEL
2	SKL307	FOOT
4 (XA, PC)	SJS9330A	AC OUTLET COVER
4 (EK)	SJS9332A	AC OUTLET COVER
6	SBC666-1	BUTTON
7	SUBD16	ROD
8	SKCD660KF	CABINET COVER
9	SGWLPJ45-KE	FRONT PANEL ASS'Y
10	SGYLPJ45-KE	FRONT GRILLE ASS'Y
18	SBD143	KNOB
19	SJFD4	OUTPUT TERMINAL(PHONO)
20	SJJ130-3	JACK
21	SJT30640LX-V	CONNECTOR(6P)
22	SJT30543-V	CONNECTOR(5P)
23	SJSD2221	CONNECTOR
24	SJS402	SOCKET(4P)
25	SJS50680WL	CONNECTOR(6P)
26	SHRD166	FL HOLDER
27	SJT30647WL	CONNECTOR(6P)
28	SJJ134B	JACK
30 ⚠ (E, EG, EB, EH) (EF, EI)	SJS9225	AC OUTLET
30 ⚠ (XA, PC)	SJS9232B	AC OUTLET
30 ⚠ (EK)	SJS9332B	AC OUTLET
31	SJT347	FUSE HOLDER
32	VJA7135	CAP
33 ⚠ (XL)	SJSD16	AC INLET
33 ⚠ (E, EG, EB, EH) (EF, EK, XB) (XA, PC, EI)	SJS9236	AC INLET
34	SUWD99	BRACKET
SCREWS, WASHERS AND NUTS		
N1	XTB3+8G	SCREW
N2	XTB3+8J	SCREW
N3	XTB3+8JFZ	SCREW
N4	XTB3+8F	SCREW
N5	SNE2129-1	SCREW
N6	XTB3+8G	SCREW

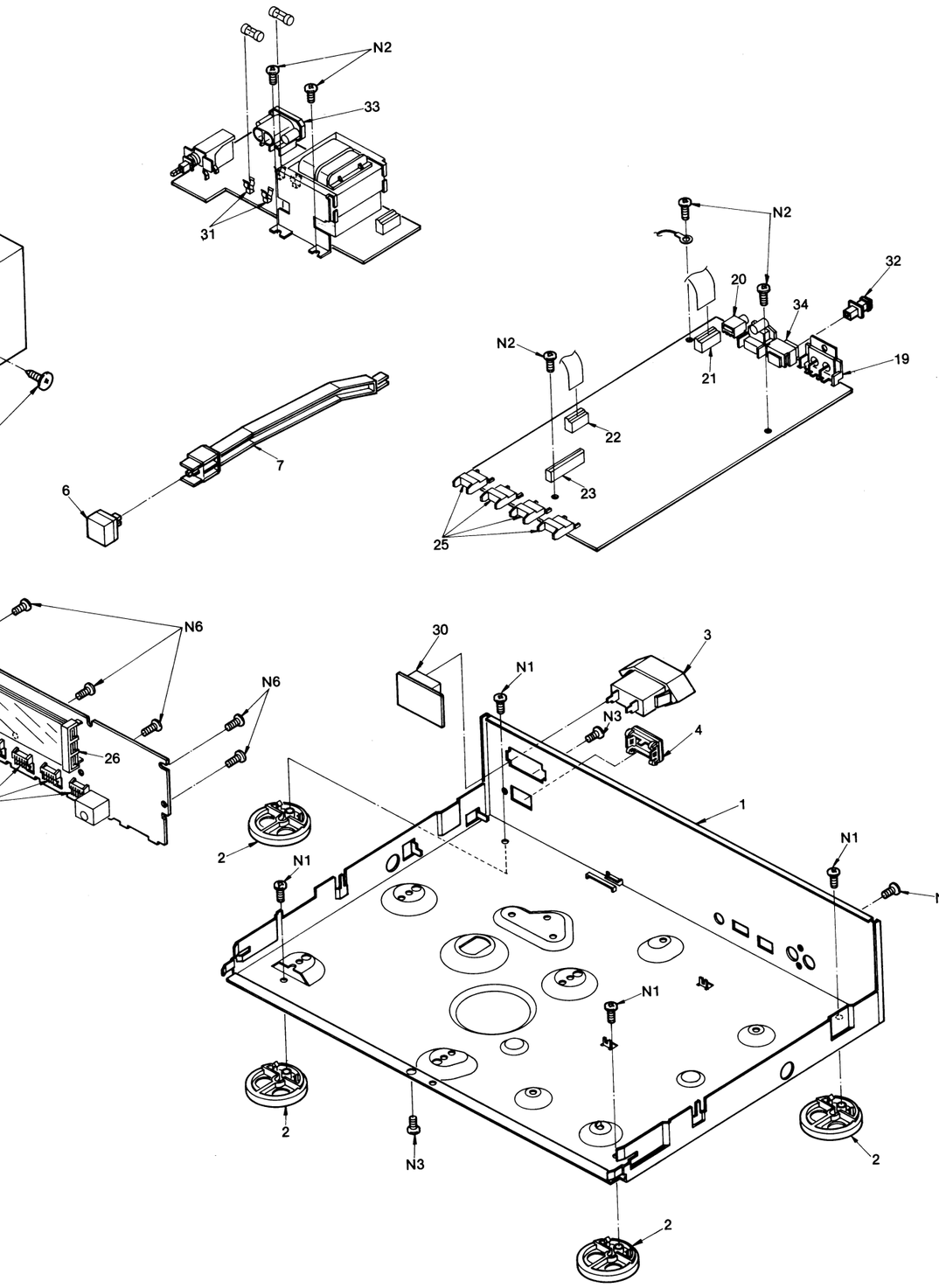
Ref. No.	Part No.	Description
LOADING MECHANICAL		
101	SGXD3130ZK0A	ORNAMENT
102	SISD22-1	TRAVERSE BASE
103	SD0D28-1E	TURNTABLE
103-1	XXE26D5	SCREW
104	SD0D29-2	RING
106	SRQA010N04	SPRING
107	S0RD37	ROLLER
108	S0RD38-E	COIL
109	SUXD123-1	GUIDE SHAFT
110 ⚠	S0AD70A	OPTICAL PICKUP
111	SHRD176-E	COIL HOLDER
112	SNSD35	SCREW
113	SHGD148	STOPPER
114	S0YD21-E	YOKE (A)(A)
115	S0YD22	YOKE (B)(B)
116	SHRD177-1	LOCK UNIT
117	SHWD33	WASHER
118	SHWD34	WASHER
119	SNSD31	SCREW
120	XTV2+5G	SCREW
121	XYN2+C8	SCREW
122	XYN26+J6	SCREW
123	SHGD153-1	CUSHION RUBBER
124	SUSD136-1	SPRING
125	SUSD137-1	SPRING
126	SNSD33	SCREW
127	SIWLP150-KM	LOADING BASE
128	SUSD145-1	SPRING
129	SUWD112	GUIDE SHAFT HOLDER
130	SURD13	ROLLER
131	SDGD58	MAIN GEAR
132	SDGD59-2	GEAR
133	SIRD94-E	LOADING MOTOR
134	XTB3+10G	SCREW
135	SMBD7	BELT
136	SIRD101-1	LOADING BASE SHAFT
137	SFUMZ15R61	WASHER
138	SDRD14	ROLLER
139	XTB3+8G	SCREW
140	SIRD93E	ROD
141	SIRD99	TRAY BASE
142	SIRD40-2	RACK GEAR
143	SIRD96	LOCK LEVER
144	SFUMZ15R61	WASHER
145	SIRD98	DISC TRAY
146	SUSD83	SPRING
147	SFXGQ06N01	SCREW
148	SIWD105	BRACKET
149	SJGDRF310T-2	SPINDLE MOTOR
150	SIRD51	HOLDER
151	SIRD42-2	CLAMPER
152	S0MD4	MAGNET
153	S0YD2	YOKE
154	SIKD150051	FLAT CABLE
155	SIKD150221-1	FLAT CABLE
156	SHRD150	ROLLER HOLDER
157	SJSD1722	CONNECTOR
158	SJSD2222	CONNECTOR(CN103)
159	SJT30543-V	CONNECTOR(5P)
160	SDRD12	ROLLER

■ EXPLODED VIEWS

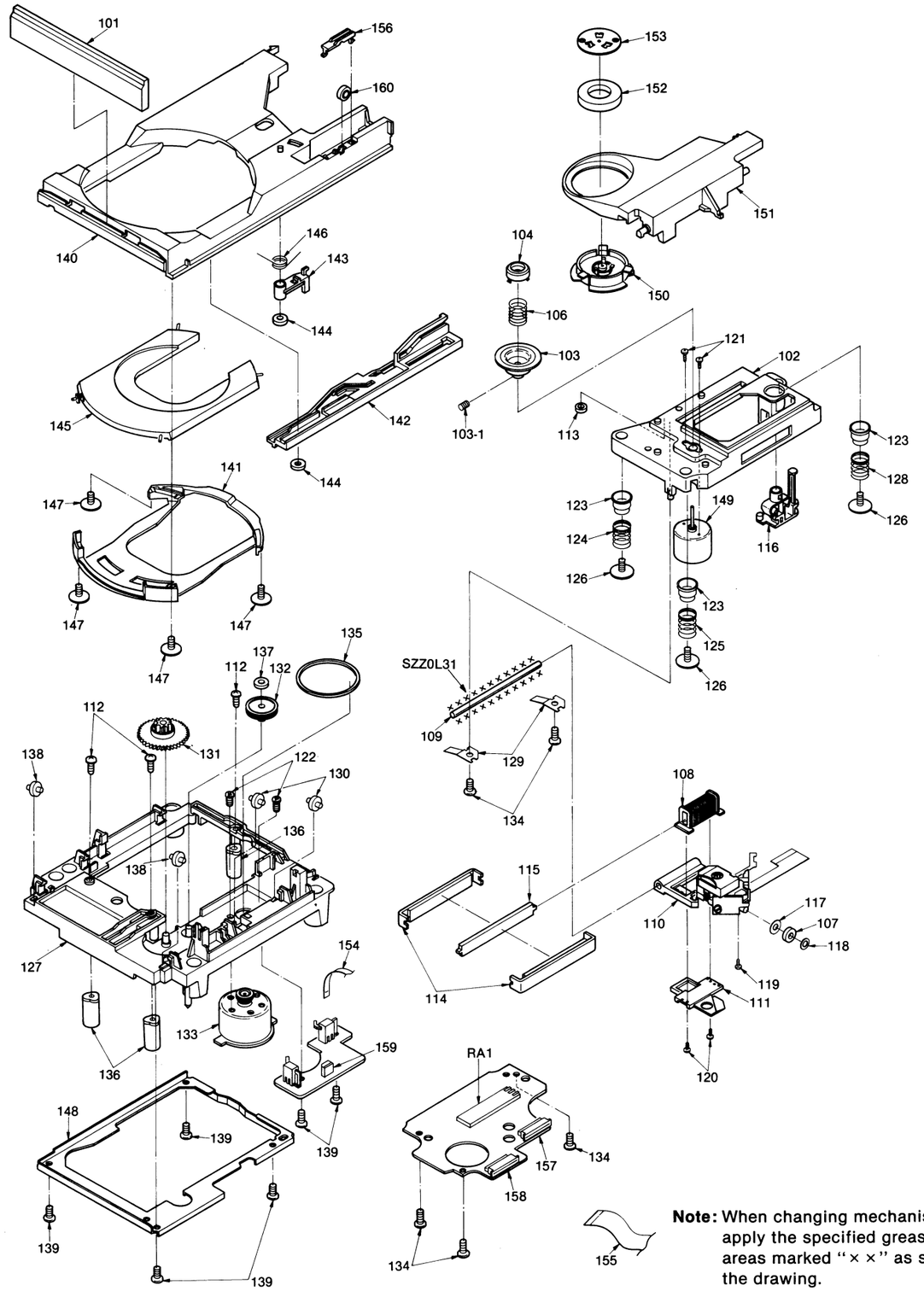
• Cabinet and chassis parts



5 6 7 8 9 10 11 12 13 14



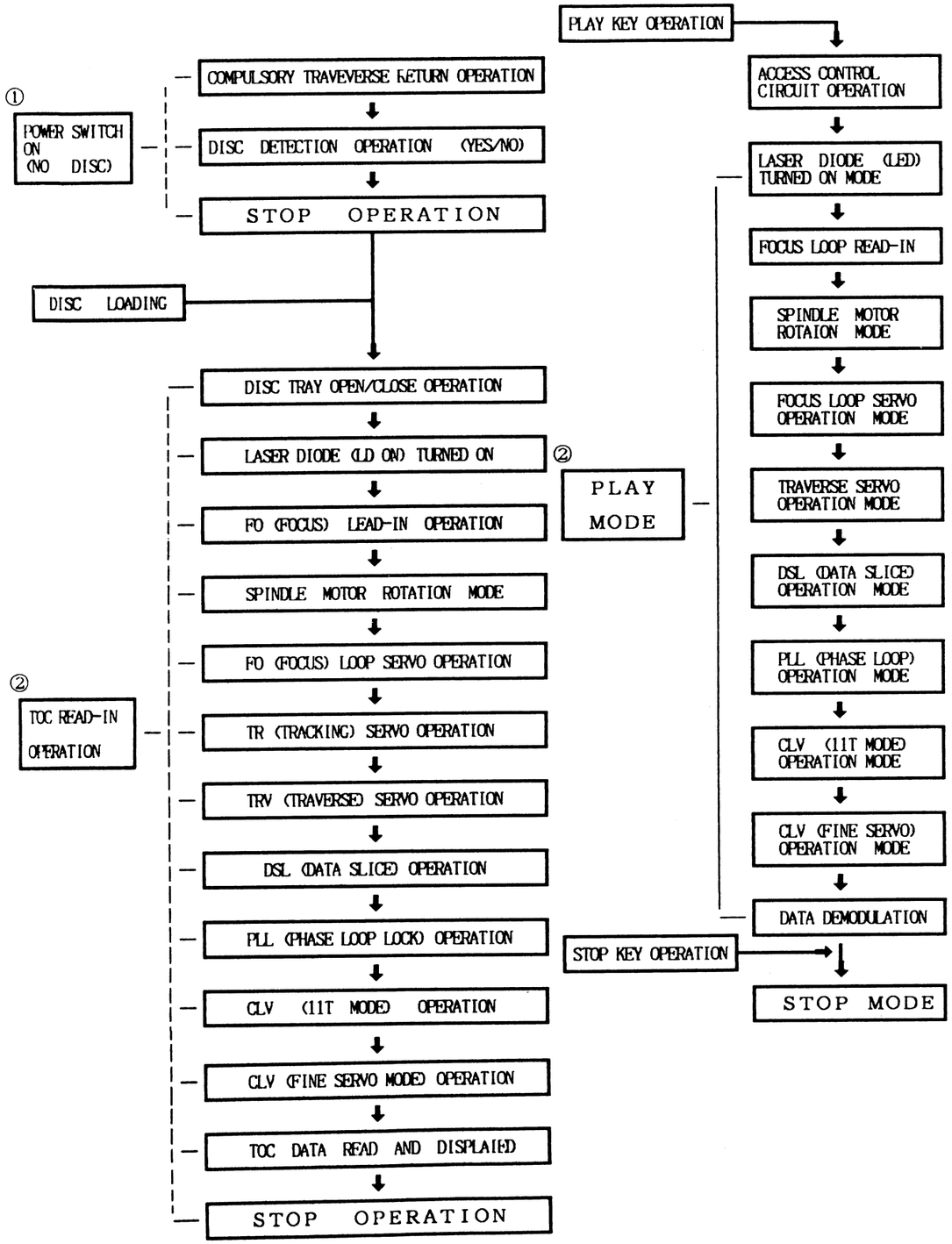
• Loading unit



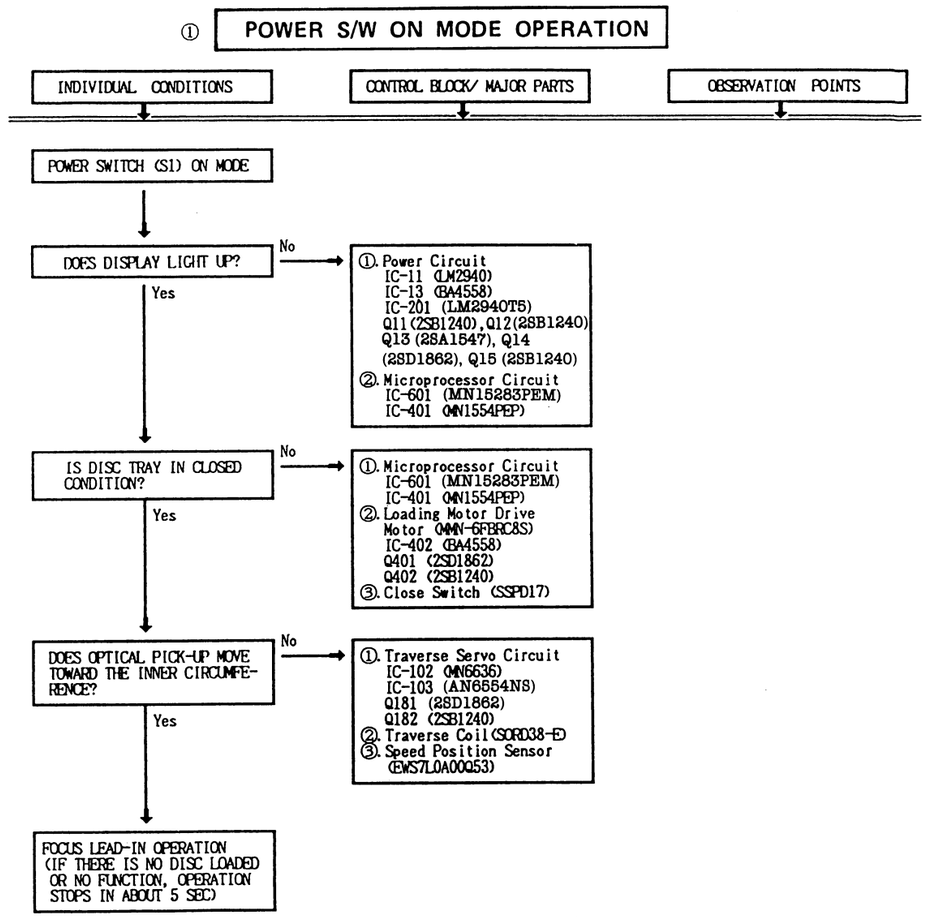
Note: When changing mechanism parts, apply the specified grease to the areas marked "× ×" as shown in the drawing.

■TROUBLESHOOTING GUIDE

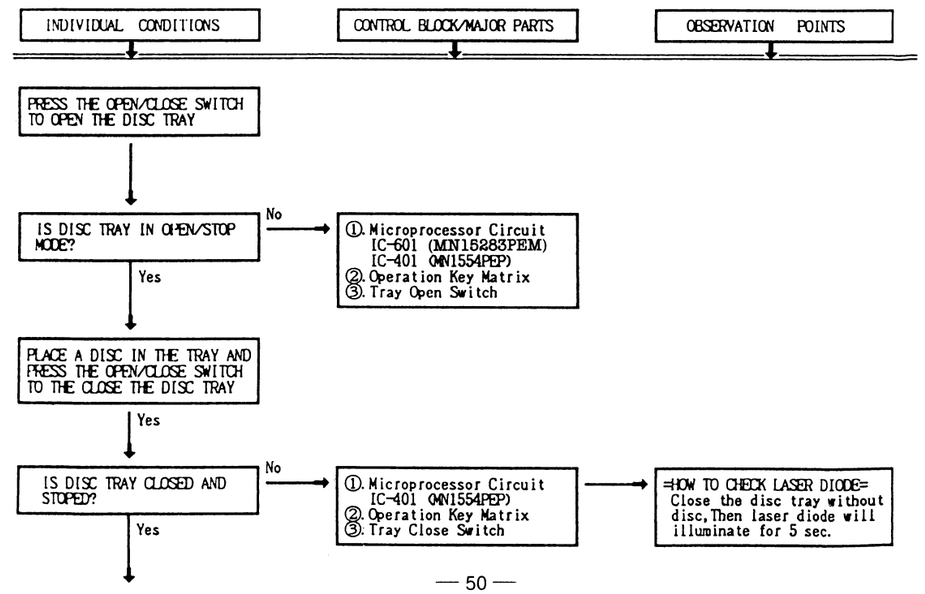
PLAYBACK FLOW CHART



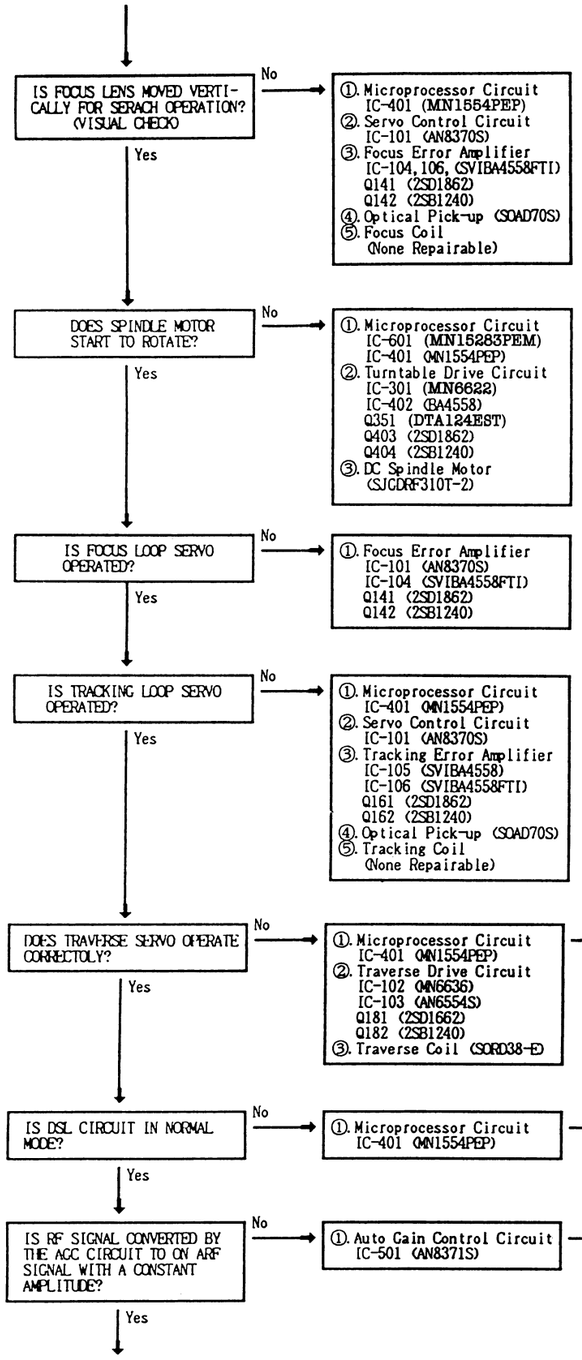
① POWER S/W ON MODE OPERATION

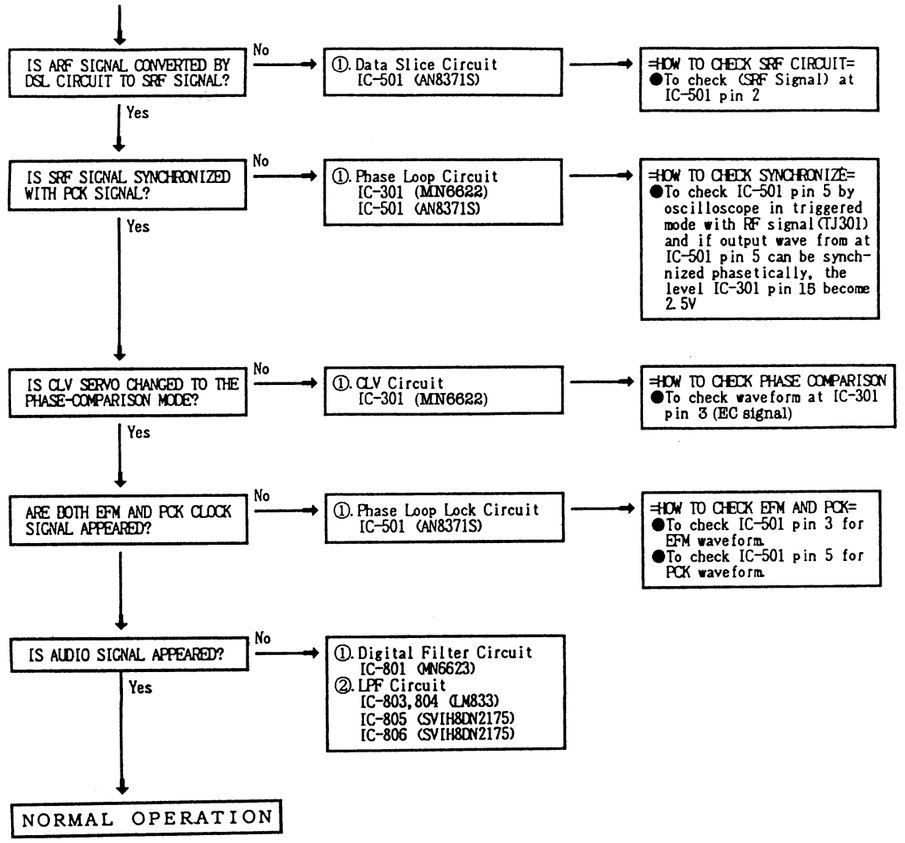


② TOC READ OPERATION ~ PLAY OPERATION


INDIVIDUAL CONDITIONS
CONTROL BLOCK/MAJOR PARTS
OBSERVATION POINTS
PRESS THE OPEN/CLOSE SWITCH TO OPEN THE DISC TRAY
IS DISC TRAY IN OPEN/STOP MODE?
No
①. Microprocessor Circuit
IC-601 (MN15283PEM)
IC-401 (MN1554PEP)
②. Operation Key Matrix
③. Tray Open Switch
Yes
PLACE A DISC IN THE TRAY AND PRESS THE OPEN/CLOSE SWITCH TO THE CLOSE THE DISC TRAY
Yes
IS DISC TRAY CLOSED AND STOPED?
No
①. Microprocessor Circuit
IC-401 (MN1554PEP)
②. Operation Key Matrix
③. Tray Close Switch
=HOW TO CHECK LASER DIODE=
Close the disc tray without disc, Then laser diode will illuminate for 5 sec.
Yes

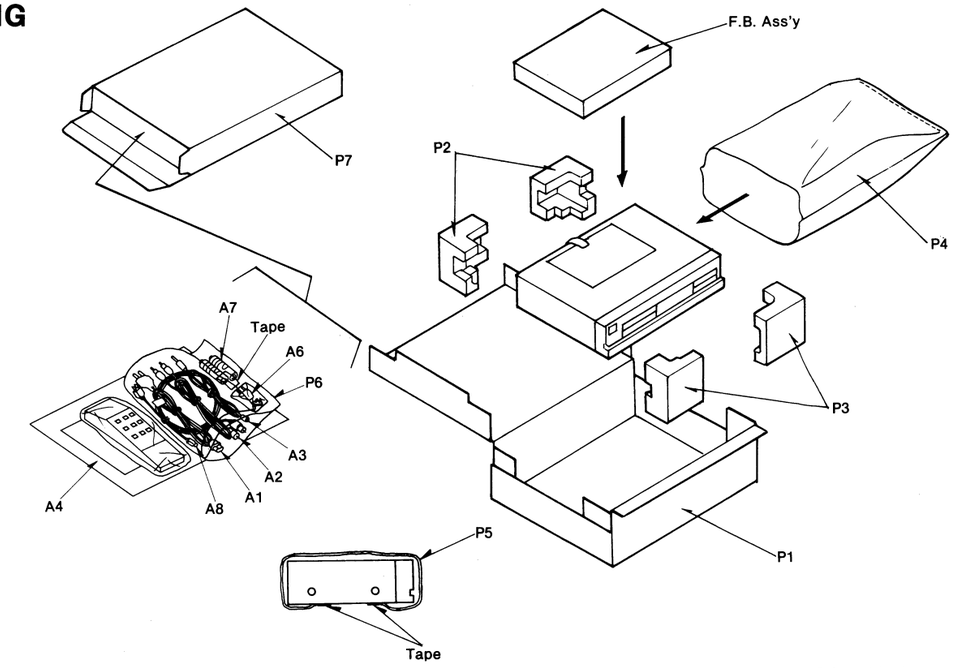
D


IS FOCUS LENS MOVED VERTICALLY FOR SERACH OPERATION? (VISUAL CHECK)
No
①. Microprocessor Circuit IC-401 (MN1554PEP)
②. Servo Control Circuit IC-101 (AN8370S)
③. Focus Error Amplifier IC-104,106, (SVIBA4558FTI) Q141 (2SD1862) Q142 (2SB1240)
④. Optical Pick-up (SOAD70S)
⑤. Focus Coil (None Repairable)
Yes
DOES SPINDLE MOTOR START TO ROTATE?
No
①. Microprocessor Circuit IC-601 (MN15283PEM) IC-401 (MN1554PEP)
②. Turntable Drive Circuit IC-301 (MN6622) IC-402 (BA4558) Q351 (DTA124EST) Q403 (2SD1862) Q404 (2SB1240)
③. DC Spindle Motor (SJCDRF310T-2)
Yes
IS FOCUS LOOP SERVO OPERATED?
No
①. Focus Error Amplifier IC-101 (AN8370S) IC-104 (SVIBA4558FTI) Q141 (2SD1862) Q142 (2SB1240)
Yes
IS TRACKING LOOP SERVO OPERATED?
No
①. Microprocessor Circuit IC-401 (MN1554PEP)
②. Servo Control Circuit IC-101 (AN8370S)
③. Tracking Error Amplifier IC-105 (SVIBA4558) IC-106 (SVIBA4558FTI) Q161 (2SD1862) Q162 (2SB1240)
④. Optical Pick-up (SOAD70S)
⑤. Tracking Coil (None Repairable)
Yes
DOES TRAVERSE SERVO OPERATE CORRECTOLY?
No
①. Microprocessor Circuit IC-401 (MN1554PEP)
②. Traverse Drive Circuit IC-102 (MN6636) IC-103 (AN6554S) Q181 (2SD1662) Q182 (2SB1240)
③. Traverse Coil (SORD38-E)
=HOW TO CHECK THE TRAVERSE=
●The sound skip every few second in play mode.
●Optical pick-up move to outward or inward alternately.
●Optical pick-up stick at inner or outer position.
Yes
IS DSL CIRCUIT IN NORMAL MODE?
No
①. Microprocessor Circuit IC-401 (MN1554PEP)
=HOW TO CHECK DSL CIRCUIT=
●The level of IC-501 pin 22 become low (L)
Yes
IS RF SIGNAL CONVERTED BY THE AGC CIRCUIT TO ON ARF SIGNAL WITH A CONSTANT AMPLITUDE?
No
①. Auto Gain Control Circuit IC-501 (AN8371S)
=HOW TO CHECK AGC CIRCUIT=
●The level of IC-501 pin 16 (ARF Signal) becom 0.8Vp-p
Yes


IS ARF SIGNAL CONVERTED BY DSL CIRCUIT TO SRF SIGNAL?
No
①. Data Slice Circuit IC-501 (AN8371S)
=HOW TO CHECK SRF CIRCUIT=
●To check (SRF Signal) at IC-501 pin 2
Yes
IS SRF SIGNAL SYNCHRONIZED WITH PCK SIGNAL?
No
①. Phase Loop Circuit IC-301 (MN6622) IC-501 (AN8371S)
=HOW TO CHECK SYNCHRONIZE=
●To check IC-501 pin 5 by oscilloscope in triggered mode with RF signal(TJ301) and if output wave from at IC-501 pin 5 can be synchnized phasetically, the level IC-301 pin 18 become 2.5V
Yes
IS CLV SERVO CHANGED TO THE PHASE-COMPARISON MODE?
No
①. CLV Circuit IC-301 (MN6622)
=HOW TO CHECK PHASE COMPARISON
●To check waveform at IC-301 pin 3 (EC signal)
Yes
ARE BOTH EFM AND PCK CLOCK SIGNAL APPEARED?
No
①. Phase Loop Lock Circuit IC-501 (AN8371S)
=HOW TO CHECK EFM AND PCK=
●To check IC-501 pin 3 for EFM waveform.
●To check IC-501 pin 5 for PCK waveform.
Yes
IS AUDIO SIGNAL APPEARED?
No
①. Digital Filter Circuit IC-801 (MN6623)
②. LPF Circuit IC-803,804 (LM833) IC-805 (SVIH8DN2175) IC-806 (SVIH8DN2175)
Yes
NORMAL OPERATION

■ PACKING

• **F.B. Ass'y**



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H880509000 AM/TN

ORDER NO. AD8808211S2

Service Manual

Supplement

Compact Disc Player

SL-PJ45

COMPACT disc DIGITAL AUDIO

DIGITAL

Color

(K) .... Black Type

Area

Color	Area
(K)	(E) .... Continental Europe.
(K)	(EK) .. United Kingdom.
(K)	(EG) .. F.R. Germany.

Please file and use this supplement manual together with the Service Manual for Model No. SL-PJ45, Order No. AD8805083C9.

■ CHANGE OF REPLACEMENT PARTS LIST

Ref. No.	Change of Part No.		Description	Pcs.	Remarks
	Made in Japan	➡ Made in Germany			
1	SGPLPJ45-KG	**SGPLPJ45-KGM**	Rear Panel [V]	1	for (EG) area
1	SGPD750ZF1A	**SGPD750ZF1B**	Rear Panel [V]	1	for (EK) area
1	SGPD750ZF0A	**SGPLPJ45-KEG**	Rear Panel [V]	1	for (E) area
P1	SPND311	**SPND8H312**	Carton Box [V]	1	

*[V]: Indicates parts that are suppled by MBV.
MBV: MB Video G.m.b.H.
(Herzbergerstrasse 51, 3360 Osterode Harz, F.R. GERMANY)

Technics

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

Printed in Japan
F880807450 TS/TW

ORDER NO. AD8809238S9

Service Manual

Supplement

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-PJ45

Color

(K)...Black Type

Area

Color	Area
(K)	(E).....Continental Europe.
(K)	(EK) .....United Kingdom.
(K)	(XL).....Australia.
(K)	(EG) .....F.R. Germany.
(K)	(EB) .....Belgium.
(K)	(EH) .....Holland.
(K)	(EF).....France.
(K)	(Ei).....Italy.
(K)	(XA) .....Asia, Latin America, Middle Near East, Africa and Oceania.
(K)	(XB) .....Saudi Arabia.
(K)	(PC) .....European Audio Club.

Modification of the Servo Circuit

Note: The SL-PJ45's servo circuit has been modified during its production. Major changes in its ICs and transistors are listed in the following table (next page). The IC401's peripheral circuit on the D P.C.B. has also been partially modified. The Supplementary Service Manual outlines all the circuitry except for the operation circuit. (No modification has been made to the operation circuit. For a schematic, see page 40 of the original Service Manual.) Use the original Service Manual (Order No. AD8805083C9) together with this Supplementary Service Manual.

CHANGES

Notes (1) Reason for Modifications: To simplify the servo circuit while improving its performance.
(2) Modifications Effective: From July, 1988 and onward
(3) Identification of Modified Units:
1): A serial number suffix of **C** or beyond indicates a modified unit.
2): A "CAUTION" label (THE ORIGINAL DESIGN HAS BEEN CHANGED. REFER TO SERVICE MANUAL (SUPPLEMENT).) has been affixed inside the chassis.

Technics

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

Panasonic Tokyo Sales Department
Matsushita Electric Industrial Co., Ltd.
World Trade Center Bldg., 4-1, Hamamatsu-cho, 2-chome, Minato-ku, Tokyo 105, Japan

■ MAJOR CHANGES IN SEMICONDUCTOR DEVICES

Ref. No.	Change of Part No. Original → New		Part Name & Description	Remarks
IC101	AN8370S	**AN8373S**	SERVO AMP	
IC102	MN6636	**AN8374S**	SERVO PROCESSOR	
IC103	AN6554NS	**AN8377**	BTL DRIVE	
IC104	AN6552S	**LM2940T5M**	REGULATOR	
IC105~106	AN6552S	**Deletion**	———	
IC201	LM2940T5	**Deletion**	———	
IC202	AN6552S	**Deletion**	———	
IC501	AN8371S	**Deletion**	———	
IC401 *	MN1554PEP	**MN1554PEW**	SYSTEM CONTROL	
Q101	2SA1547-Q	**2SA1547QSTV2**	A.P.C.	
Q141	2SD1862-P	**Deletion**	———	
Q142	2SB1240-P	**Deletion**	———	
Q161	2SD1862-P	**Deletion**	———	
Q162	2SB1240-P	**Deletion**	———	
Q181	2SD1862-P	**Deletion**	———	
Q182	2SB1240-P	**Deletion**	———	
Q201, 203	2SD1862-P	**Deletion**	———	

* IC401: System-controlling microprocessor on the D P.C.B. All other ICs and transistors listed in this table are used on the B Servo P.C.B.
* A comprehensive electrical parts list, regarding the servo circuit, appears on pages 21~23 of this Supplementary Service Manual.
(None of the mechanical parts have been affected by these modifications. Refer to the original Service Manual.)

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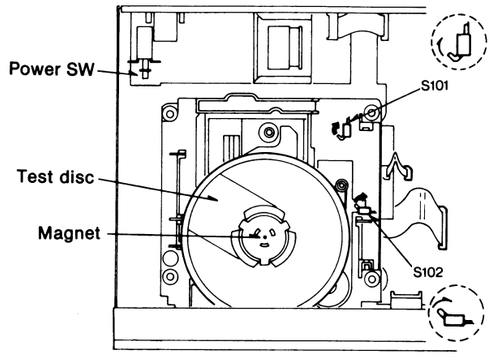
■ MEASUREMENTS AND ADJUSTMENTS

Caution:
- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned "on", laser radiation is emitted from the pickup lens. Avoid exposure to the laser beam, especially when performing adjustments.

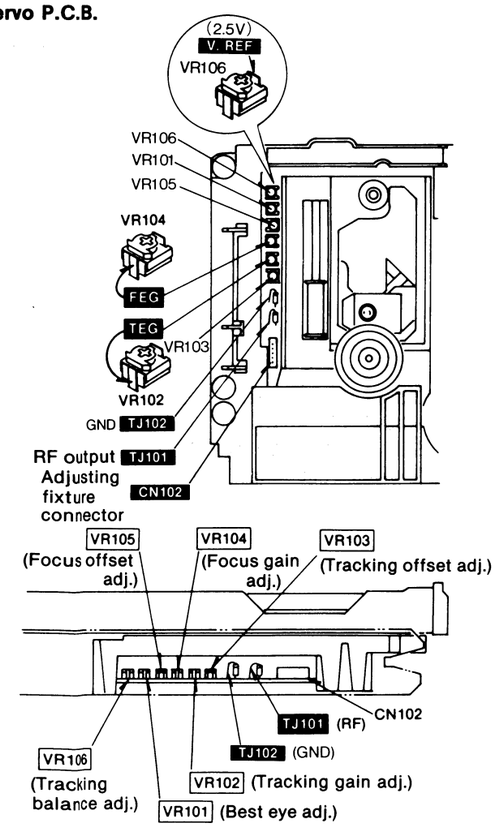
PREPARATION

1. Remove the cabinet (see Ref. No. 1 in the original Service Manual).
2. Remove the disc clamper and magnet (see Ref. No. 2 of the same).
3. Remove the disc holder and power switch rod (see Ref. No. 3 of the same).
4. Place the test disc and magnet on the turntable.
5. While holding the Open/Close switches (S101, S102) in the directions indicated by the arrows, switch the player power ON.
6. After the test disc starts rotating, release the Open/Close switch (S101, S102).

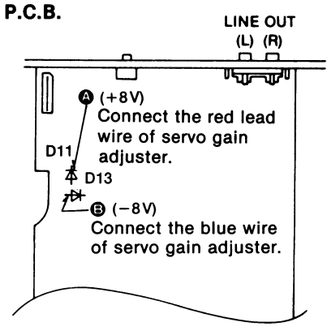


ADJUSTMENT POINTS

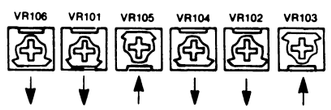
• Servo P.C.B.



• Main P.C.B.



• Temporary setting of each VR



(Temporary VR setting if any of the trimmer VRs are replaced or require readjustment, temporarily set them to the following positions.)

Measuring Instruments and Special Tools
- * Servo gain adjuster (SZZP1017F)
- * Test discs
- 1. Playability test disc (SZZP1054C or SZZP1014F)
- 2. Uneven test disc (SZZP1056C)
- 3. Black band test disc (SZZP1057C)
- * Normal disc
- * Dual-beam oscilloscope with bandwidth of 30MHz or better (with EXT trigger and 1:1 probe).
- * Audio frequency (AF) oscilator
- * Conversion connector (SZZP1032F)
- * Allen wrench (M2.0)
- * Allen wrench (M1.27)
- * 0.9mm clearance gauge (RZZ0297)

Perform adjustments depend on the part to be replaced according to followings:

(1) Spindle motor ..... Items 1, 3 to 8
(2) Turntable ..... Items 1, 3 to 8
(3) Optical pickup ..... Items 2 to 8

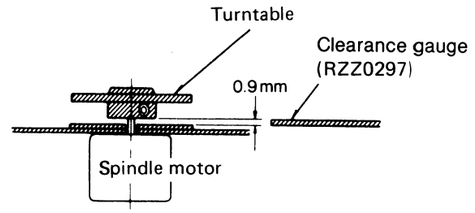
Adjusting Procedure

* If you have replaced the spindle motor or turntable, do the following adjustment:

(1) TURNTABLE HEIGHT ADJUSTMENT

1. Insert the 0.9mm clearance gauge (RZZ0297) between the turntable and the loading base (see the figure at right).
2. Tighten the turntable retention screw with the 1.27mm allen wrench.
3. Connect the oscilloscope's CH. 1 probe across VR104's **FEG** (+) and VR106's **V. REF** (−) terminals via a filter.
   (Note: A voltage of 2.5V appears at the V. REF terminal. Take care not to short the player's chassis to the oscilloscope ground.)
   Oscilloscope setting: VOLT . . . . . 50 mV
   SWEEP . . . . . 1 ms.
   Input coupling . . . DC
4. Adjust oscilloscope's DC zero balance.
5. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
6. Measure the voltage amplitude of the signal on the oscilloscope.

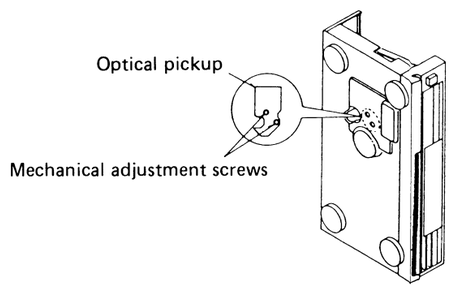
Note 1. If the measured amplitude is within a range of +/− 15mV, the turntable height is correct. If it is outside this range, adjust the turntable height by using the clearance gauge as a pry.
If the amplitude exceeds +15mV, lower turntable.
If the amplitude is below −15mV, elevate the turntable.

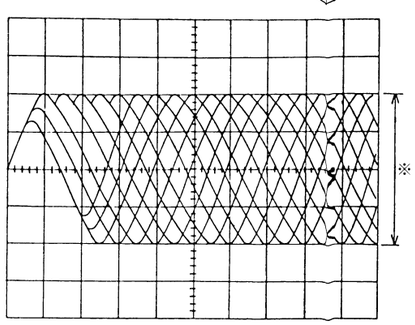


Note 2. If the measured amplitude greatly surpasses or falls short of the range above, set **VR105** at or around the center, then try to adjust the height again. (Then be sure to adjust the focus offset as well.)

(2) MECHANICAL ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (−) on the Servo P.C.B.
   Oscilloscope setting: VOLT . . . . . 100 mV
   SWEEP . . . . . 0.5 μs.
   Input coupling . . . AC
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1056C).
3. Leave the player in Play mode, and place it on its right side as shown at right.
4. Alternately adjust the two mechanical adjusting screws with the 2.0mm allen wrench until the RF signal amplitude variation on the oscilloscope is minimized.
5. After completing the adjustment, lock the **mechanical adjustments** with lock paint (RZZOL01).

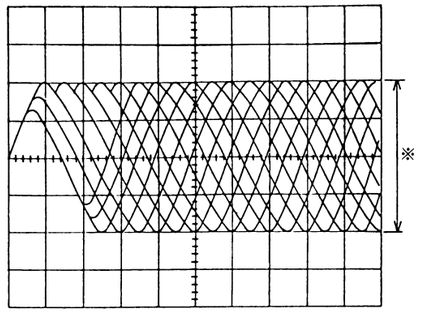




※ Minimize the variation of amplitude.

(3) BEST EYE (PD BALANCE) ADJUSTMENT

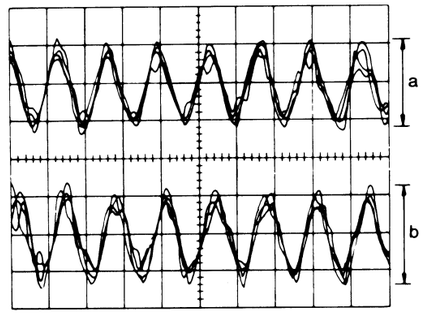
1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B.
   Oscilloscope setting: VOLT . . . . . 100 mV
   SWEEP . . . . . 0.5 μ s.
   Input coupling . . . AC
2. Switch the player power **ON**, and play the 0.5 mm black dot on the test disc (SZZP1014F or SZZP1054C).
3. Adjust **VR101** until the RF signal eye pattern amplitude is maximized.



※ Maximize the amplitude.

(4) FOCUS GAIN ADJUSTMENT

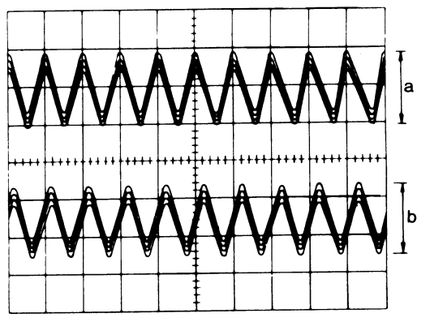
1. Connect the servo gain adjuster to the player (see page 7).
2. Set the servo gain adjuster's gain switch to position **"2"** and the ON/OFF switch to **ON**.
3. Set up the AF oscillator output for **825Hz, 150 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
4. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, respectively (TP3 is GND).
   Oscilloscope setting: VOLT . . . . . 100 mV (both channels)
   SWEEP . . . . . 0.2 ms.
   Input coupling . . . AC
5. Play the test disc (SZZP1014F or SZZP1054C).
6. Set the servo gain adjuster's gain switch to position "3", and you will see a 825 Hz signal on the oscilloscope. Adjust **VR104** until the signal amplitudes on both channels become identical to each other.
7. Set the gain switch back to position **"2"**.



※ Adjust **VR104** until a equals b.

(5) TRACKING GAIN ADJUSTMENT

1. Set up the AF oscillator output for **1.1 kHz, 150 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
2. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, respectively (TP3 is GND).
   Oscilloscope setting: VOLT . . . . . 100 mV (both channels)
   SWEEP . . . . . 0.2 ms.
   Input coupling . . . AC
3. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
4. Set the servo gain adjuster's gain switch to position "1", and you will see a 1.1 kHz signal on the oscilloscope. Adjust **VR102** until the signal amplitudes on both channels become identical to each other.
5. Set the gain switch back to position **"2"**.

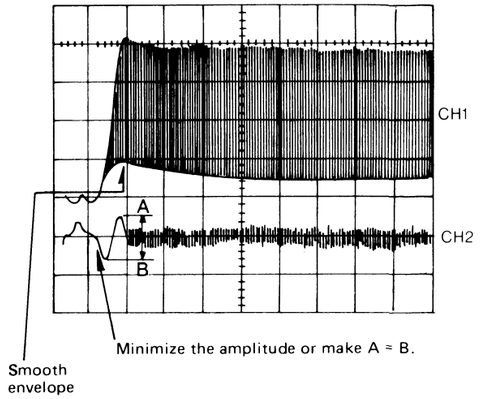


※ Adjust VR102 until a equals b.

(6) FOCUS OFFSET ADJUSTMENT

Note: Make sure that the servo gain adjuster's gain switch is set to position **"2"**.

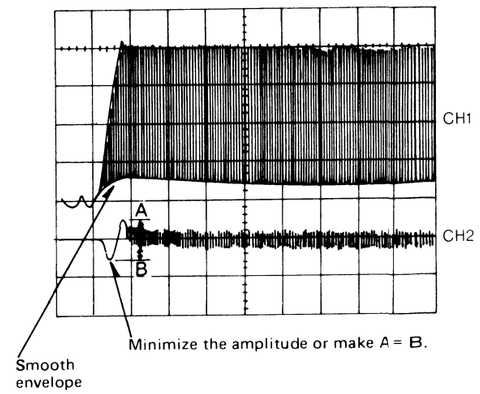
1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B. and its CH. 2 probe (+) to VR104's **FEG** terminal.
   Oscilloscope setting: VOLT. . . . . .100 mV (CH. 1)
   100 mV (CH. 2)
   SWEEP. . . . . .0.2 ms.
   Input coupling. . . AC (both CH. 1 and 2)
   Trigger mode . . . .NORM (trigger CH. 1.)
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1057C).
3. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR105** until the dip in the RF signal envelope on CH. 1 is smooth and the signal amplitude on CH. 2 is minimized, i.e. when amplitude A equals amplitude B.



(7) TRACKING OFFSET ADJUSTMENT

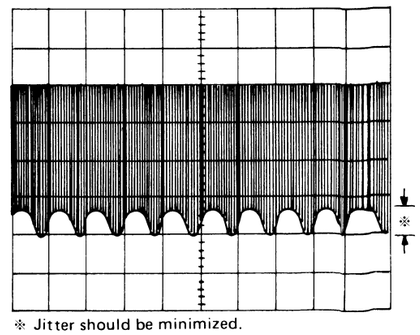
Note: Make sure that the servo gain adjuster's gain switch is set to position **"2"**.

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B., and its CH. 2 probe (+) to VR102's **TEG** terminal.
   Oscilloscope setting: VOLT. . . . . .100 mV (CH. 1)
   100 mV (CH. 2)
   SWEEP. . . . . .0.2 ms.
   Input coupling. . AC (both CH. 1 and 2)
   Trigger mode. . . NORM (trigger CH. 1.)
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1057C).
3. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR103** until the dip in the RF signal envelope on CH. 1 is smooth and the signal amplitude on CH. 2 is minimized, i.e. when amplitude A equals amplitude B.



(8) TRACKING BALANCE ADJUSTMENT

1. Make sure that servo gain adjuster's gain switch is set to position **"2"**.
2. Set up the AF oscillator output for **1.1 kHz, 600 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
3. Connect oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B. and CH. 2 probe (+) to the OSC terminal on the servo gain adjuster.
   Oscilloscope setting: VOLT. . . . . .100 mV (CH. 1)
   200 mV (CH. 2)
   SWEEP. . . . . .0.1 ms.
   Input coupling. . .AC (both CH. 1 and 2)
   Trigger mode . . .NORM (trigger CH. 2)
4. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
5. Set the servo gain adjuster's gain switch to position **"1"**, and adjust **VR106** until the jitter contained in the signal waveform on CH. 1 is minimized as shown below.
6. Disconnect the servo gain adjuster's leads from the player.



※ Jitter should be minimized.

(9) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

*** Checking Skip Search**

1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

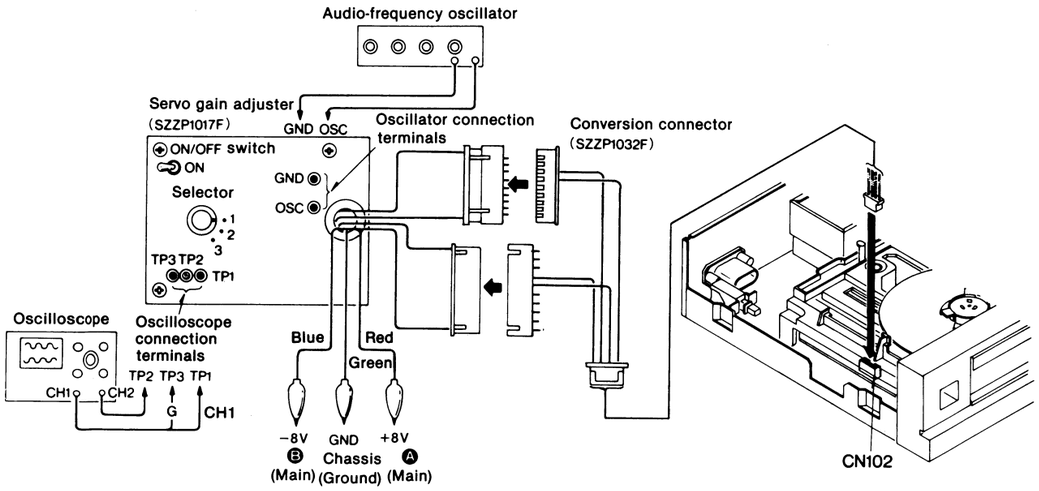
*** Checking Manual Search**

1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

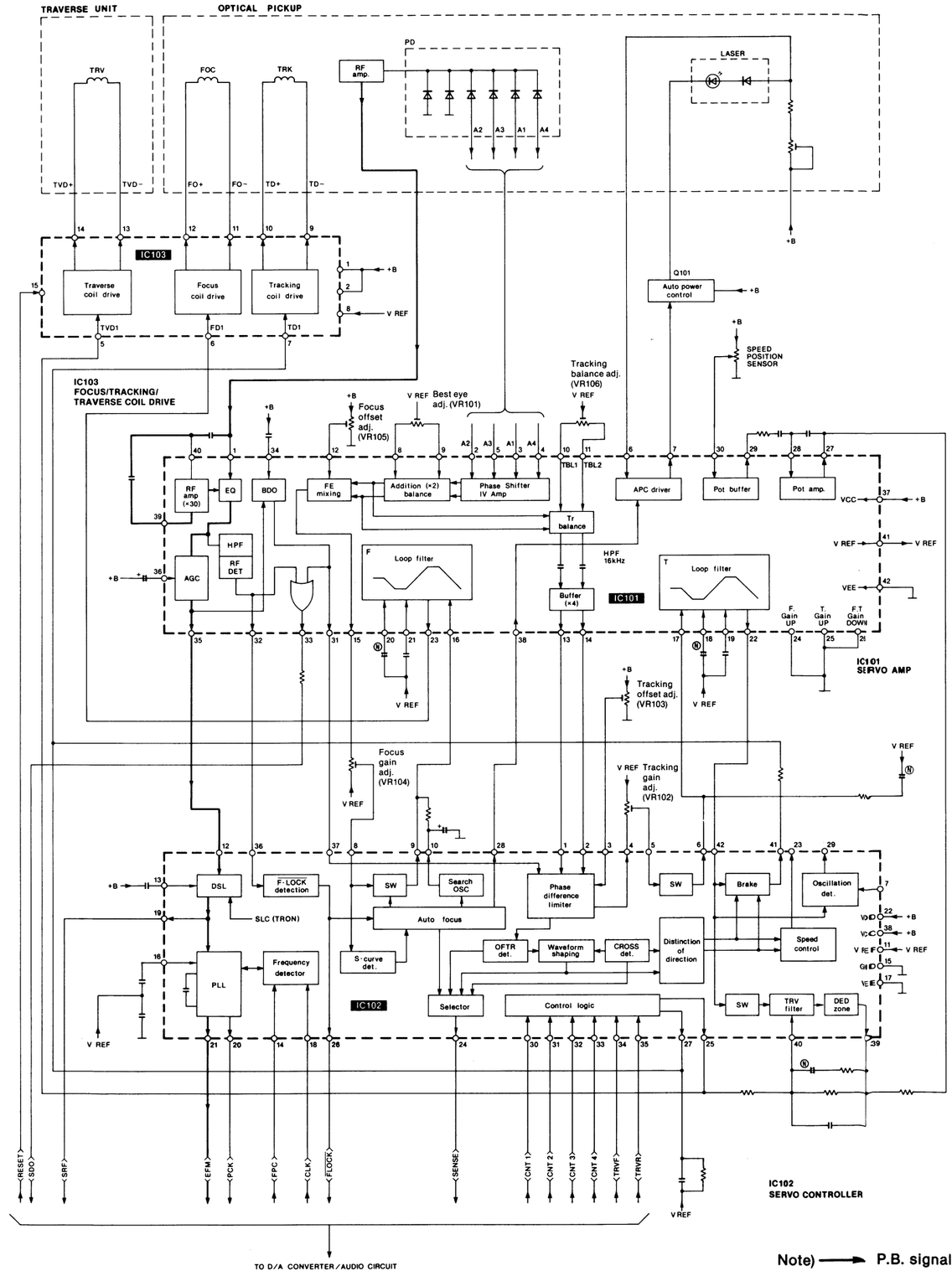
*** Checking Using Defect Disc**

1. Play the 0.7 mm black dot and the 0.7 mm wedge on the defect test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc and verify that no sound skip or noise occurs.

• Connection of servo gain adjuster



■ BLOCK DIAGRAM OF SERVO CIRCUIT



■ TERMINAL FUNCTION OF ICs

• IC101 (AN8373S): Servo amp.

Pin No.	Mark	I/O Division	Function
1	AMP1	I	RF signal input (X30 amp.)
2	PDAD	I	Photo detector current input (A2)
3	PDA	I	Photo detector current input (A1)
4	PDBD	I	Photo detector current input (A4)
5	PDB	I	Photo detector current input (A3)
6	LPD	I	Non-inverting laser power input
7	LD	O	Laser power auto control output
8	FBL1	I	PD balance adjustment
9	FBL2	I	
10	TBL1	I	Tracking balance adjustment
11	TBL2	I	
12	FOOFS	I	Focus offset adjustment
13	IVA	O	Current/voltage conversion output (A)
14	IVB	O	Current/voltage conversion output (B)
15	FE	O	Focus gain adjustment output
16	FPI	I	Focus error signal input
17	TPI	I	Tracking error signal input
18	C. TPL	I	Tracking error filter capacitor input
19	C. TPH		
20	C. FPL	I	Focus error filter capacitor input
21	C. FPH		

Pin No.	Mark	I/O Division	Function
22	TPO	O	Tracking error signal output
23	FPO	O	Focus error signal output
24	FGC	I	Focus gain up signal input (Not used, connected to GND)
25	TGC	I	Tracking gain up signal input (Not used, connected to GND)
26	GD	I	Focus/tracking down signal input (Not used, connected to GND)
27	PTO	O	Position detecting amp. output
28	PTI	I	Position detecting amp. input
29	PBO	O	Position detecting buffer output
30	POT	I	Position detecting buffer input
31	BDO	O	Dropout detection output
32	$\overline{\text{RFDET}}$	O	RF detection signal output
33	SDO	O	Dropout detection pulse output
34	C. SBDO	I	Dropout detecting capacitor input
35	ARF	O	RF signal output
36	C. AGC	I	AGC detecting capacitor input
37	VCC	I	Power supply (+5 V input)
38	LDON	I	Laser power control input
39	RF IN	I	RF signal input
40	AMPO	O	RF signal output
41	VREF	O	Reference voltage output
42	GND	I	Ground terminal

• IC102 (AN8374S): Servo processor

Pin No.	Mark	I/O Division	Function
1	LSA	I	Phase difference input (A)
2	LSB	I	Phase difference input (B)
3	TEOFS	I	Tracking offset adjustment
4	TE	O	Tracking gain adjustment
5	TEG	I	
6	TE OUT	O	Tracking error signal output
7	TE BPF	I	Tracking error gain detecting filter (Not used, open)
8	FEG	I	Focus gain adjustment
9	FE OUT	O	Focus error signal output
10	CLW	O	Triangular wave oscillator capacitor output
11	VREF	I	Reference voltage input
12	ARF	I	RF signal input
13	CDSL	I	Data slice filter capacitor input
14	FPC	I	Frequency difference signal input
15	GND	I	Ground terminal
16	C. PLL	I	PLL loop filter constant
17	VSS	I	Ground terminal
18	CLK	I	Frequency pull-in clock signal (88.2 kHz) input
19	SRF	O	Sliced and digitized RF signal output
20	PCK	O	Clock output extracted from SRF
21	EFM	O	EFM signal output synchronous with PCK

Pin No.	Mark	I/O Division	Function
22	VDD	I	Power supply (+5 V input)
23	SPCNT	O	Track crossing speed control output output (Not used, open)
24	SENSE	O	Selector output (track crossing state)
25	TRV	O	Traverse servo control output
26	$\overline{\text{FLOCK}}$	O	Focus lock signal output
27	KICK	O	Track kick signal output
28	LDON	O	Laser power control output
29	VDET	O	Focus/tracking gain up output (Not used, open)
30	CNT1	I	Control input (FOON: Focus servo ON signal)
31	CNT2	I	Control input (TRON: Tracking servo ON signal)
32	CNT3	I	Control input (KICKF: Kick direction (forward) command)
33	CNT4	I	Control input (KICKR: Kick direction (reverse) command)
34	TRVF	I	Traverse forward command signal
35	TRVR	I	Traverse backward command signal
36	$\overline{\text{RFDET}}$	I	RF detection signal input
37	BDO	I	Dropout detection input
38	VCC	I	Power supply (+5 V input)
39	TVPO	O	Traverse position detecting resistor/capacitor inputs
40	TVPI	I	
41	BROUT	O	Tracking drive control output
42	BRIN	I	Tracking error signal input

- **IC103 (AN8377): BTL drive**

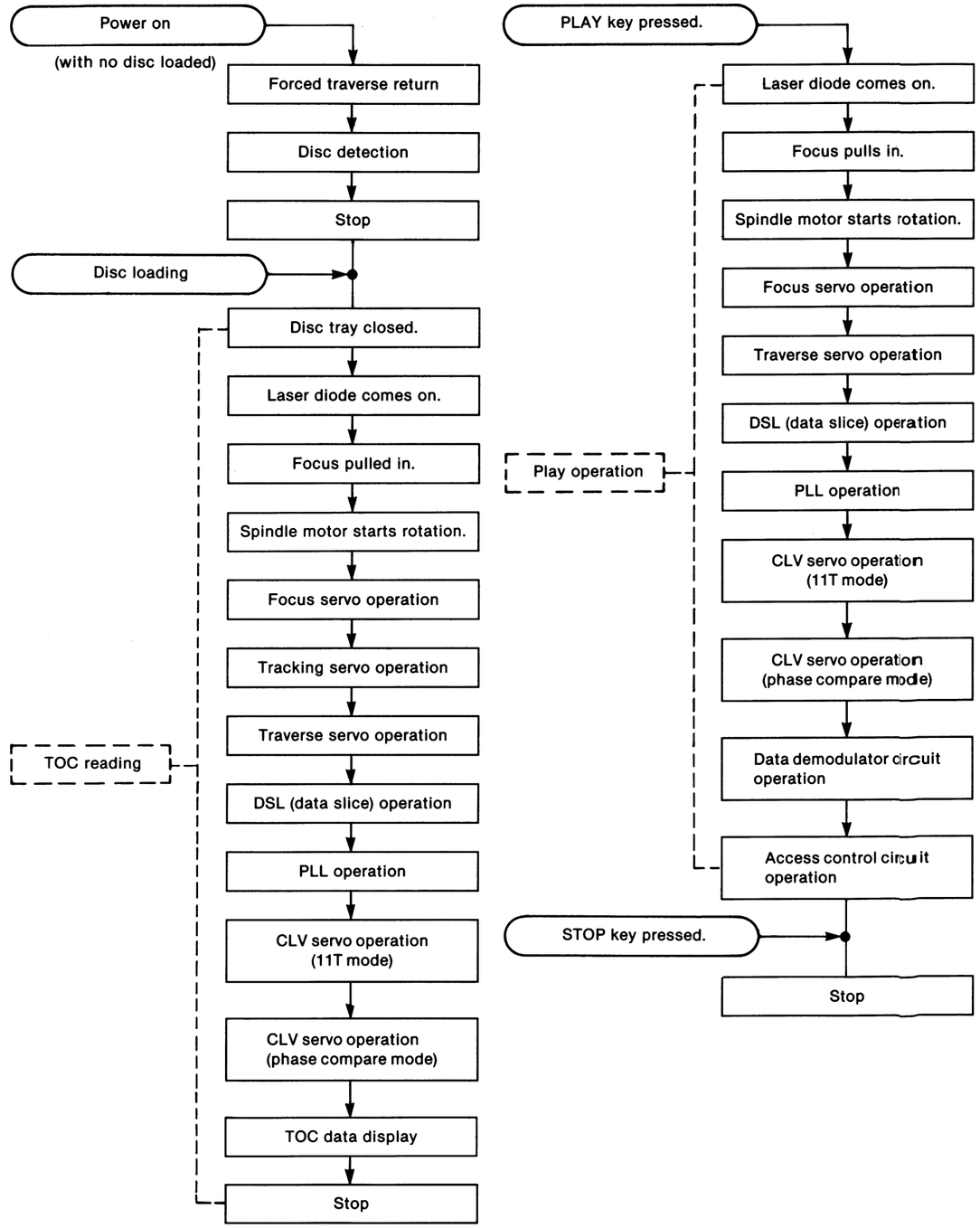
Pin No.	Mark	I/O Division	Function
1	PVCC	I	Driver power supply (+5 V input)
2	VCC	I	Power supply (+5 V input)
3	TB	O	External transistor base driving output
4	VMON	O	Voltage (+5 V) output
5	TVDI	I	Traverse error signal input
6	FDI	I	Focus error signal input
7	TDI	I	Tracking error signal input
8	VREF	I	Reference voltage input

Pin No.	Mark	I/O Division	Function
9	TD–	O	Inverting output of tracking driver
10	TD+	O	Non-inverting output of tracking driver
11	FD–	O	Inverting output of focus driver
12	FD+	O	Non-inverting output of focus driver
13	TVD–	O	Inverting output of traverse driver
14	TVD+	O	Non-inverting output of traverse driver
15	$\overline{\text{RESET}}$	O	Reset signal output
16	PC	I	PC input (connect to GND)

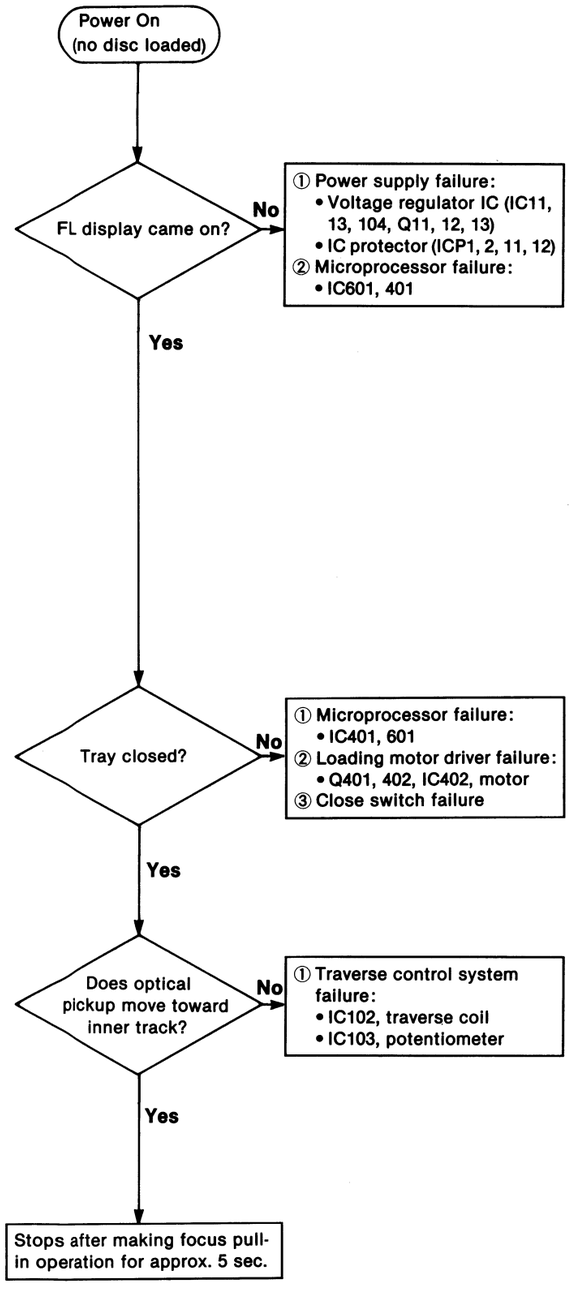
■ TROUBLESHOOTING GUIDE

SL-PJ45 Operation Sequence Check Sheet

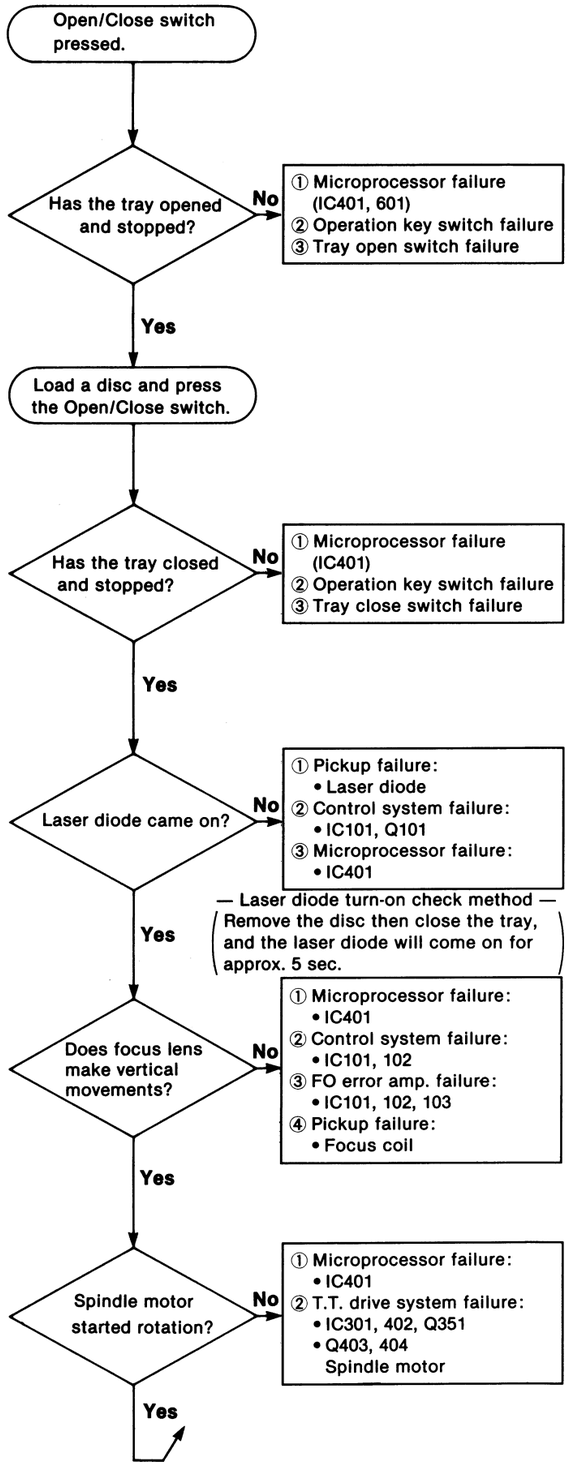
Play Operation Sequence

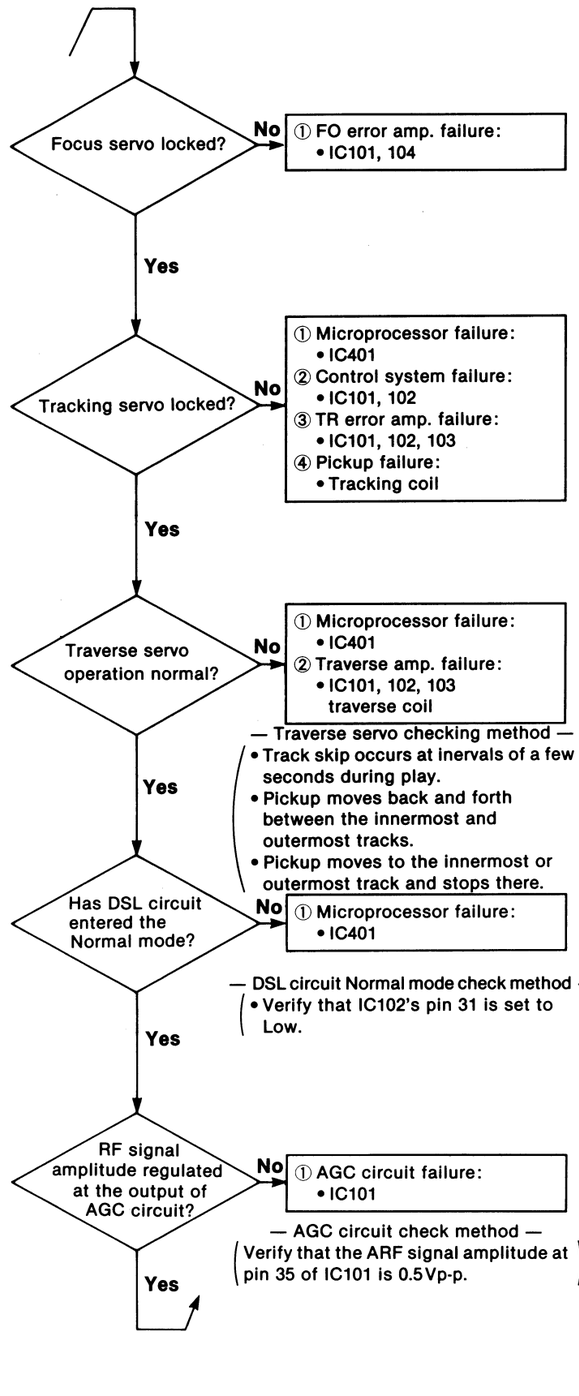


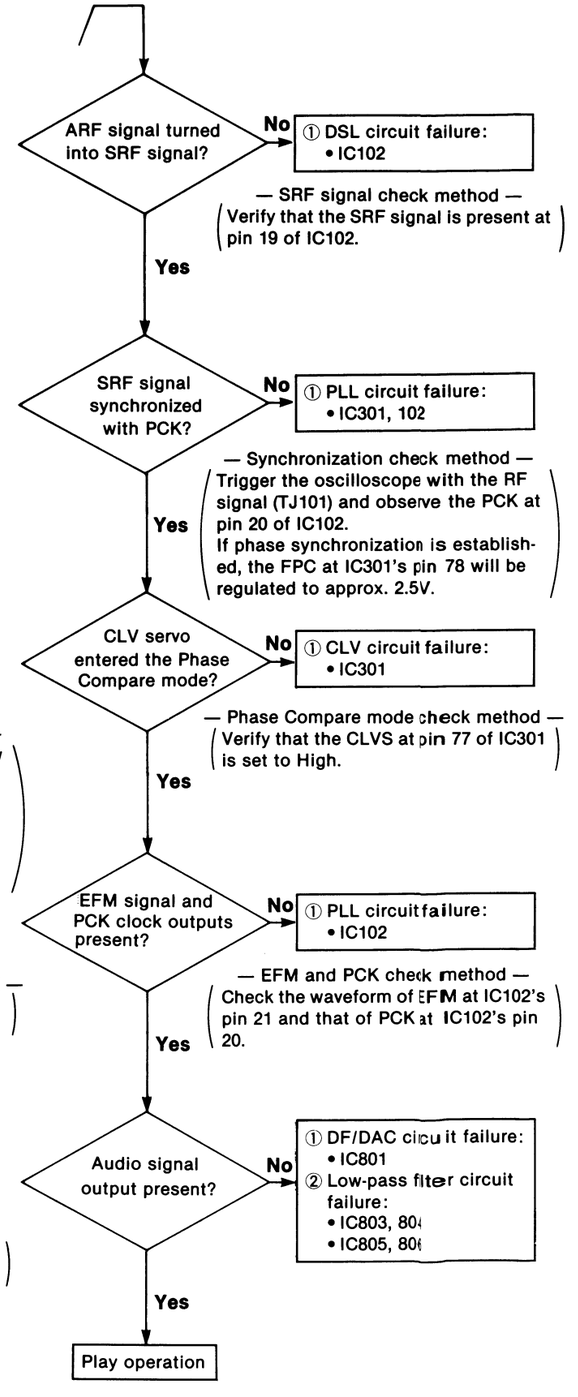
(Operation Sequence Just After Power On)



(TOC Read Operation-PLAY Operation)

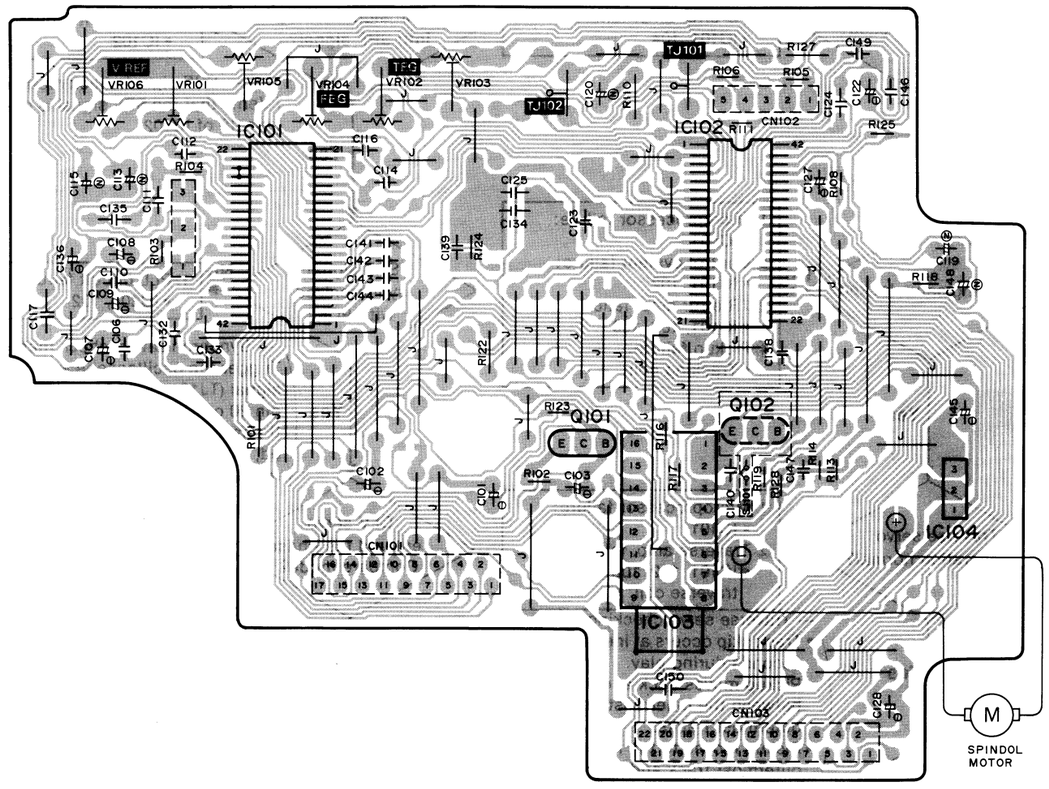



Focus servo locked?
No
① FO error amp. failure:
• IC101, 104
Yes
Tracking servo locked?
No
① Microprocessor failure:
• IC401
② Control system failure:
• IC101, 102
③ TR error amp. failure:
• IC101, 102, 103
④ Pickup failure:
• Tracking coil
Yes
Traverse servo operation normal?
No
① Microprocessor failure:
• IC401
② Traverse amp. failure:
• IC101, 102, 103
traverse coil
— Traverse servo checking method —
• Track skip occurs at inervals of a few seconds during play.
• Pickup moves back and forth between the innermost and outermost tracks.
• Pickup moves to the innermost or outermost track and stops there.
Yes
Has DSL circuit entered the Normal mode?
No
① Microprocessor failure:
• IC401
— DSL circuit Normal mode check method —
• Verify that IC102's pin 31 is set to Low.
Yes
RF signal amplitude regulated at the output of AGC circuit?
No
① AGC circuit failure:
• IC101
— AGC circuit check method —
Verify that the ARF signal amplitude at pin 35 of IC101 is 0.5Vp-p.
Yes


ARF signal turned into SRF signal?
No
① DSL circuit failure:
• IC102
— SRF signal check method —
Verify that the SRF signal is present at pin 19 of IC102.
Yes
SRF signal synchronized with PCK?
No
① PLL circuit failure:
• IC301, 102
— Synchronization check method —
Trigger the oscilloscope with the RF signal (TJ101) and observe the PCK at pin 20 of IC102.
If phase synchronization is established, the FPC at IC301's pin 78 will be regulated to approx. 2.5V.
Yes
CLV servo entered the Phase Compare mode?
No
① CLV circuit failure:
• IC301
— Phase Compare mode check method —
Verify that the CLVS at pin 77 of IC301 is set to High.
Yes
EFM signal and PCK clock outputs present?
No
① PLL circuit failure:
• IC102
— EFM and PCK check method —
Check the waveform of EFM at IC102's pin 21 and that of PCK at IC102's pin 20.
Yes
Audio signal output present?
No
① DF/DAC circuit failure:
• IC801
② Low-pass filter circuit failure:
• IC803, 804
• IC805, 806
Yes
Play operation

■ PRINTED CIRCUIT BOARDS

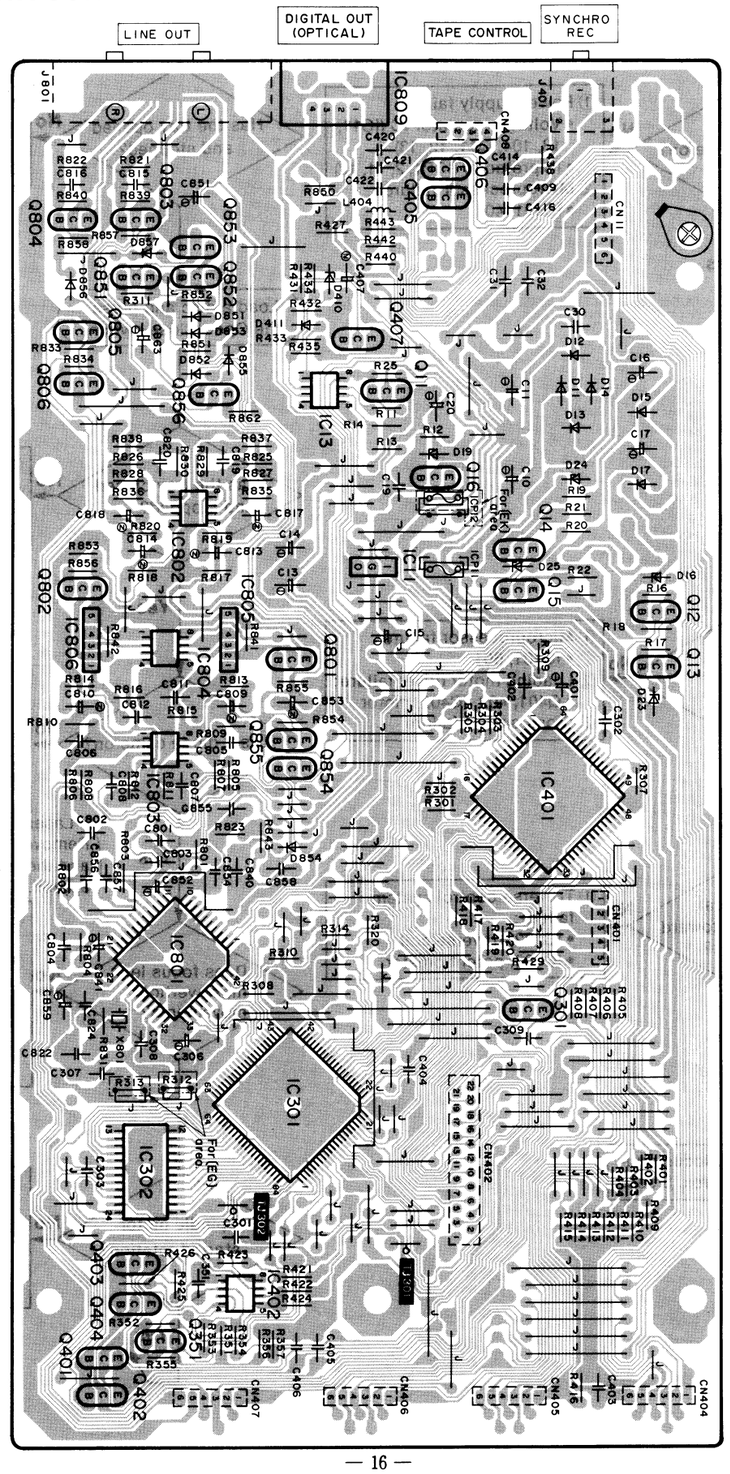
B SERVO P.C.B.



Note: Original circuit uses AN8377 for IC103 while the new circuit uses AN8377N for IC103. (Refer to the table below for other changes.)

IC103 / Modifications	AN8377	AN8377N
IC104	LM2940T5M	Removed
Q102	Removed	2SB1240QR Added
C140	0.01µF	Removed
C145	6V 100µF	Removed
Jumper SJ101	Removed	Shorted

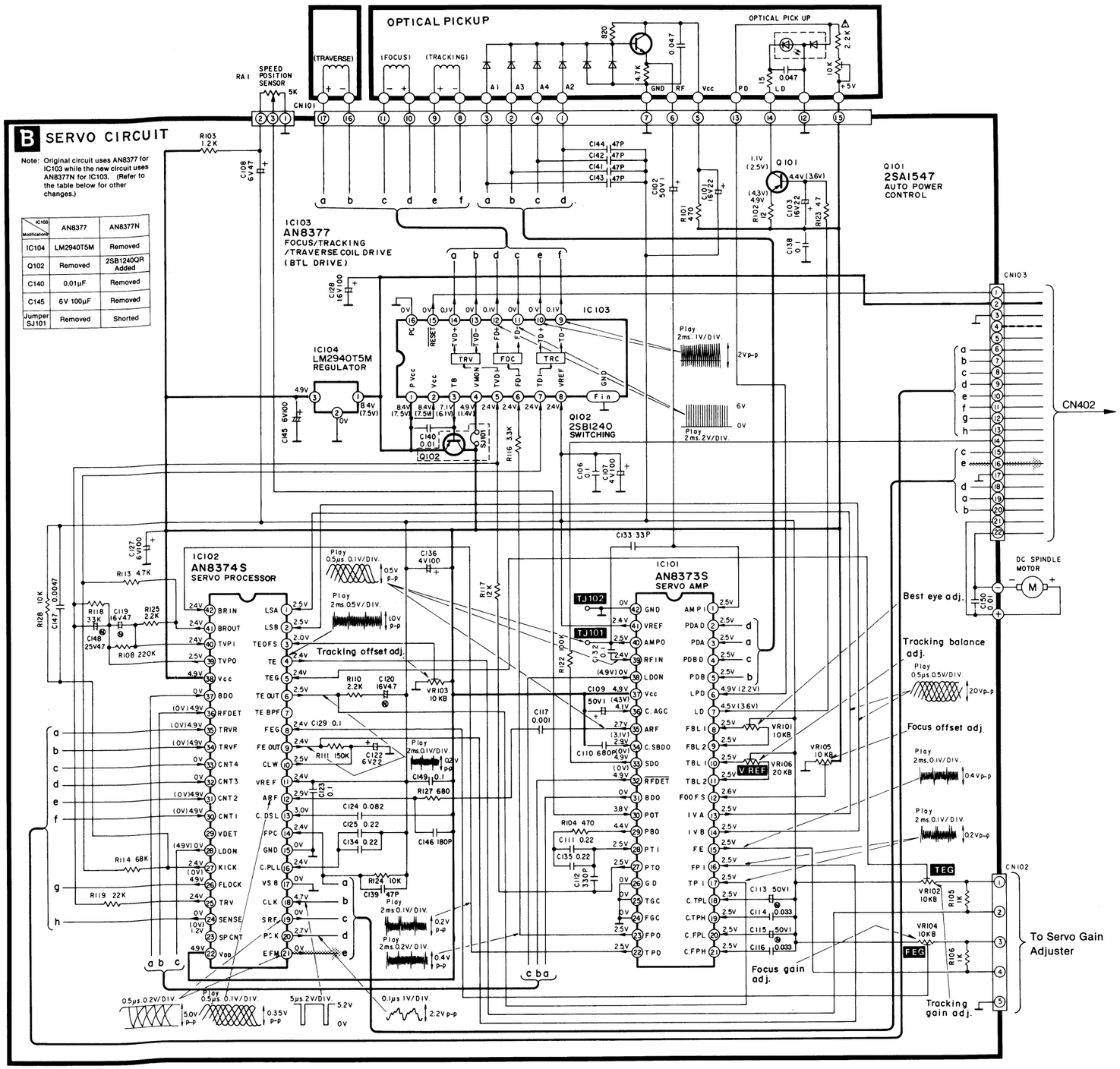
D D/A CONVERTER/AUDIO P.C.B.



B SERVO CIRCUIT

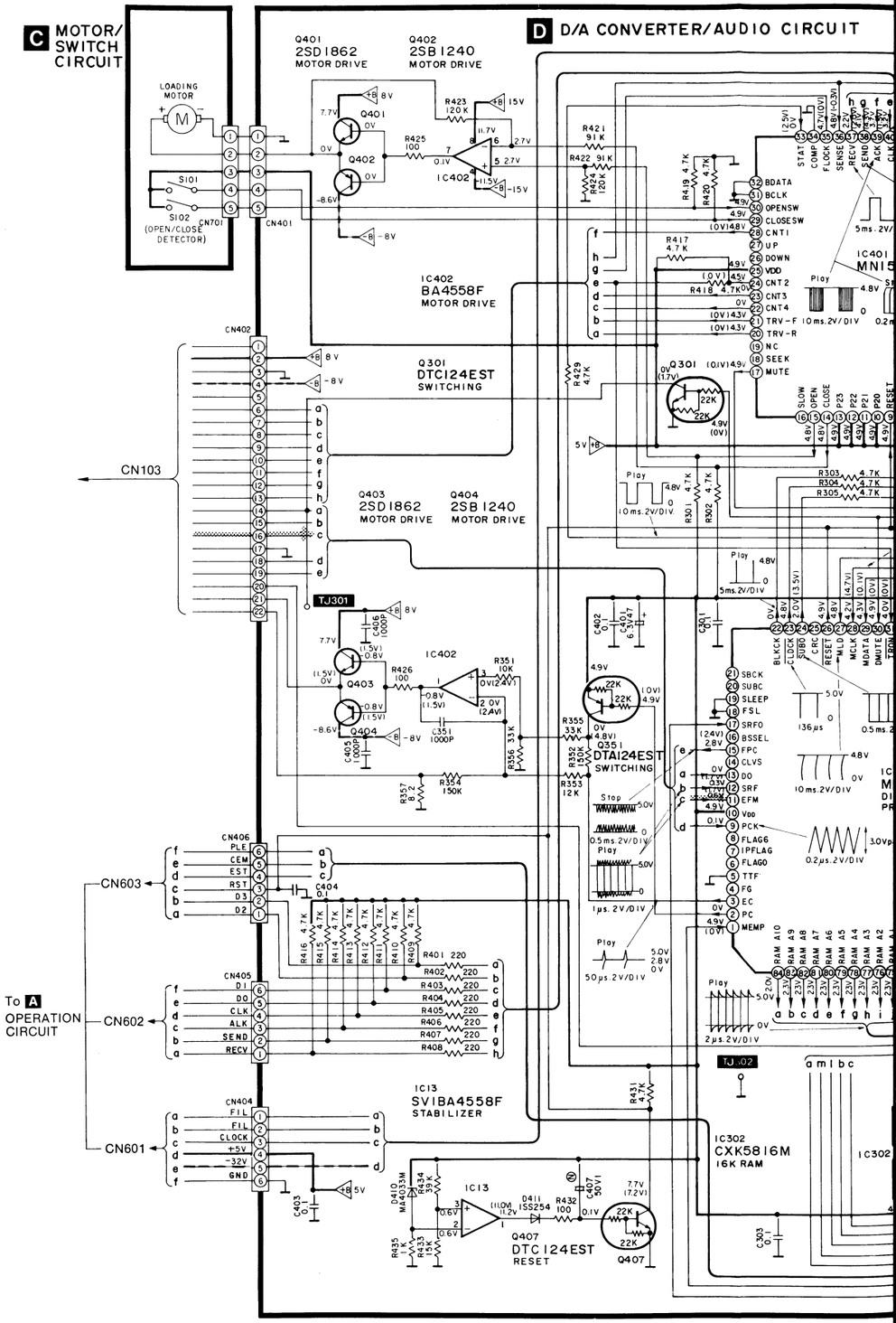
Note: Original circuit uses AN8377 for IC103 while the new circuit uses AN8377N for IC103. (Refer to the table below for other changes.)

IC103 / Modification	AN8377	AN8377N
IC104	LM2940T5M	Removed
Q102	Removed	2SB1240QR Added
C140	0.01μF	Removed
C145	6V 100μF	Removed
Jumper SJ101	Removed	Shorted



C MOTOR/ SWITCH CIRCUIT

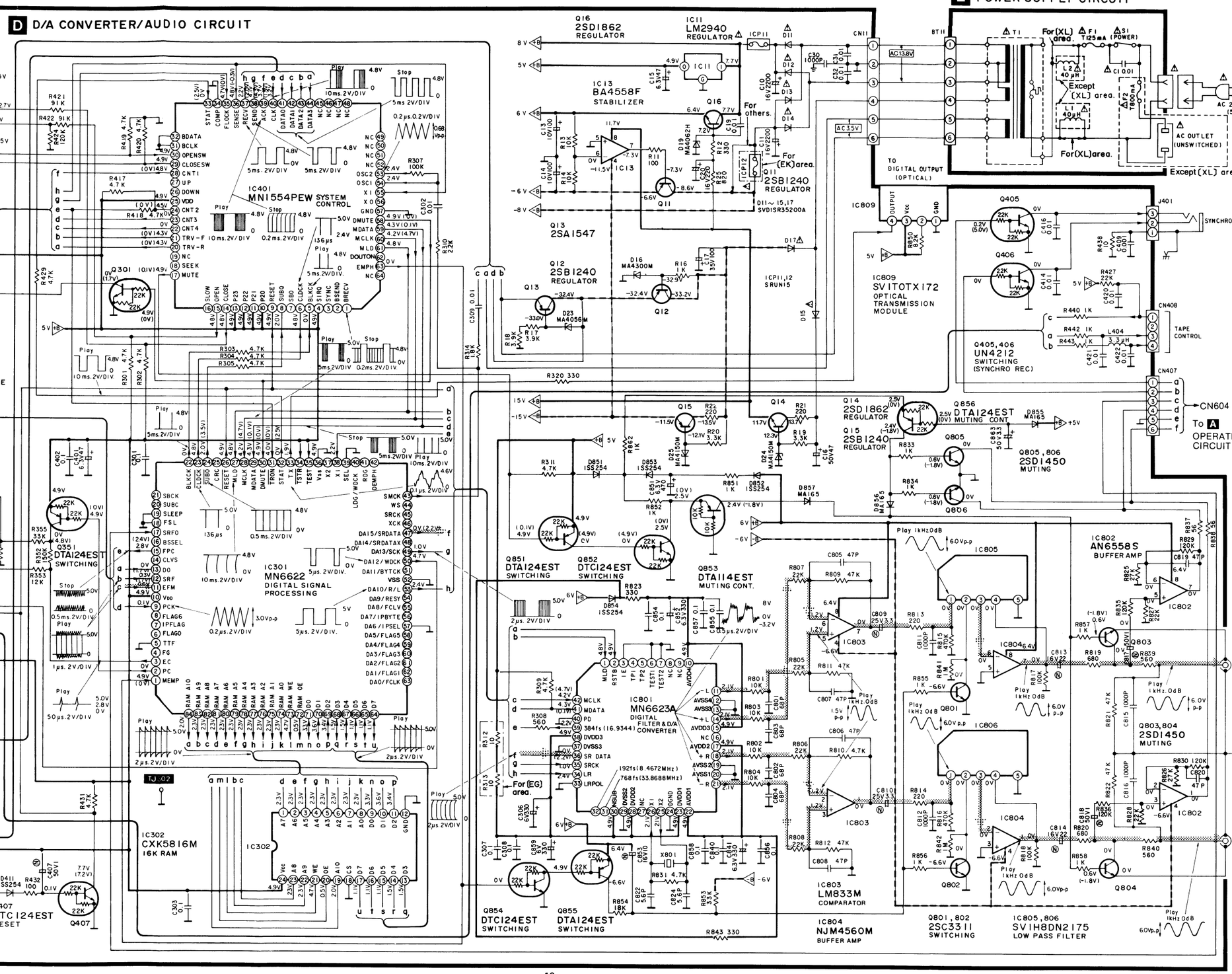
D D/A CONVERTER/AUDIO CIRCUIT



9 10 11 12 13 14 15 16 17

D D/A CONVERTER/AUDIO CIRCUIT

E POWER SUPPLY CIRCUIT



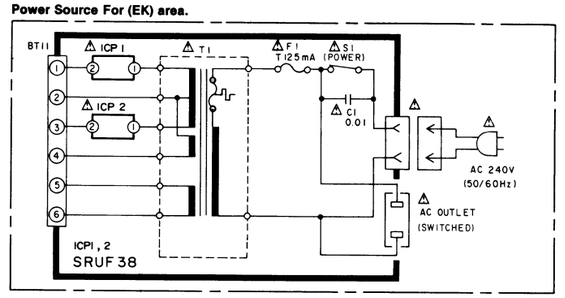
■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with development of new technology.)

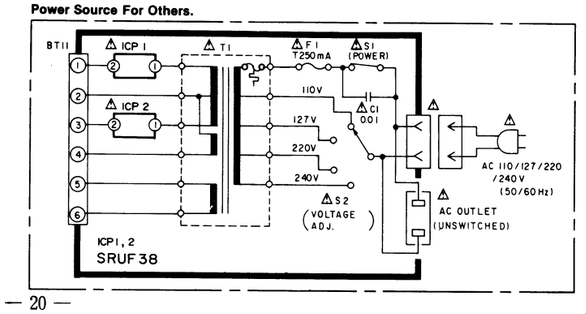
Notes:

- **S1** : Power switch in "**on**" position.
- **S2** : Voltage selector switch. (For [XA], [XB] and [PC] only.)
- **S101** : Disc holder open/close detection switch.
- **S102** : Disc holder open/close detection switch.
- **S601~610, 618, 619** : Numeric switch. (0~10, +10)
- **S611** : Programmed-play switch.
- **S612** : Cancel switch.
- **S613** : Time-mode select switch.
- **S614** : Repeat switch.
- **S615** : Recall switch.
- **S616** : Forward skip/search switch.
- **S617** : Backward skip/search switch.
- **S620** : Tape-side select switch.
- **S621** : Compact-disc edit switch.
- **S622** : Disc tray open/close switch.
- **S623** : Stop switch.
- **S624** : Pause switch.
- **S625** : Play switch.
- **S626** : Music scan switch.
- **S627** : Warp switch.
- **S628** : Link switch.
- **S651** : Timer stand-by switch.
- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
  * The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.
- Important safety notice: Components identified by △ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- ⊣□⊢/-⊣□⊢--- : Positive voltage lines and negative voltage lines.
  ▒▒▒ : Audio signal lines.

Power Source For (EK) area.



Power Source For Others.



■ RESISTORS AND CAPACITORS

Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Numbering System For Resistors

Example:

ERD	25	F	J	102
Type	Wattage (1/4W)	Shape	Tolerance	Value (1KΩ)

ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470Ω)

Numbering System For Capacitors

Example:

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001μF)	Tolerance	Unique

ECEA	50	M	330
Type	Voltage (50V)	Characteristics	Value (33μF)

- Capacity values are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F).
- Resistance values are in ohms (Ω), unless specified otherwise, 1K = 1,000Ω, 1M = 1,000kΩ

Resistor Type		Wattage		Tolerance
ERD	: Carbon	10 : 1/8W	12 : 1/2W	J : ±5%
ERG	: Metal Oxide	14 : 1/4W	25 : 1/4W	F : ±1%
ERQ	: Fuse Type Metal	1A : 1W	18 : 1/8W	G : ±2%
ERX	: Metal Film	S2 : 1/4W	S1 : 1/2W	J : ±5%
ERD L	: Carbon (chip)	2F : 1/4W	50 : 1/2W	K : ±10%
ERO K	: Metal Film (chip)	2A : 2W	3A : 3W	M : ±20%
ERC	: Solid	6G : 1/10W	8G : 1/8W	
ERF	: Incombustible Box-Shaped			
ERM	: Wire-Wound			
RRJ	: Chip Resistor			
ERJ	: Chip Resistor			

Capacitor Type		Voltage		Tolerance
ECE	: Electrolytic	0J : 6.3V	1A : 10V	K : ±10%
ECCD	: Ceramic	1C : 16V	1E : 25V	M : ±20%
ECKD	: Ceramic Capacitor	1H : 50V	1V : 35V	Z : +80 % −20
ECQM	: Polyester	50 : 50V	05 : 50V	J : ±5%
ECQP	: Polypropylene	2H : 500V	2A : 100V	G : ±2%
ECG	: Ceramic	1 : 100V	1J : 63V	F : ±1%
ECEA N	: Non Polar Electrolytic	KC : 400V AC		C : ±0.25pF
QCU	: Ceramic (Chip Type)	KC : 125V AC (UL)		D : ±0.5pF
ECUX	: Ceramic (Chip Type)			
ECF	: Semiconductor			
EECW	: Liquid electrolyte double layer capacitor			

Ref. No.	Part No.	Value.
RESISTORS(VALUE,WATTAGE)		
R11	ERDS2TJ101	100 1/4
R12	ERDS2TJ331	330 1/4
R13	ERDS2TJ103	10K 1/4
R14	ERDS2TJ103	10K 1/4
R16	ERDS2TJ102	1K 1/4
R17	ERDS2TJ392	3.9K 1/4
R18	ERDS2TJ392	3.9K 1/4
R19	ERDS2TJ332	3.3K 1/4
R20	ERDS2TJ332	3.3K 1/4
R21	ERD25FVJ221T	220 1/4
R22	ERD25FVJ221T	220 1/4
R301	ERDS2TJ472	4.7K 1/4
R302	ERDS2TJ472	4.7K 1/4
R303	ERDS2TJ472	4.7K 1/4
R304	ERDS2TJ472	4.7K 1/4
R305	ERDS2TJ472	4.7K 1/4
R307	ERDS2TJ104	100K 1/4
R308	ERDS2TJ561	560 1/4
R309	ERDS2TJ472	4.7K 1/4
R310	ERDS2TJ222	2.2K 1/4
R311	ERDS2TJ472	4.7K 1/4
R312	ERDS2TJ100	10 1/4
(EG)		
R313	ERDS2TJ100	10 1/4
(EG)		
R314	ERDS2TJ182	1.8K 1/4
R320	ERDS2TJ331	330 1/4
R351	ERDS2TJ103	10K 1/4
R352	ERDS2TJ154	150K 1/4
R353	ERDS2TJ123	12K 1/4
R354	ERDS2TJ154	150K 1/4
R357	ERDS2TJ8R2	8.2 1/4
R401	ERDS2TJ221	220 1/4
R402	ERDS2TJ221	220 1/4
R403	ERDS2TJ221	220 1/4
R404	ERDS2TJ221	220 1/4
R405	ERDS2TJ221	220 1/4
R406	ERDS2TJ221	220 1/4
R407	ERDS2TJ221	220 1/4
R408	ERDS2TJ221	220 1/4
R409	ERDS2TJ472	4.7K 1/4
R410	ERDS2TJ472	4.7K 1/4
R411	ERDS2TJ472	4.7K 1/4
R412	ERDS2TJ472	4.7K 1/4
R413	ERDS2TJ472	4.7K 1/4
R414	ERDS2TJ472	4.7K 1/4
R415	ERDS2TJ472	4.7K 1/4
R416	ERDS2TJ472	4.7K 1/4
R417	ERDS2TJ472	4.7K 1/4
R418	ERDS2TJ472	4.7K 1/4
R419	ERDS2TJ472	4.7K 1/4
R420	ERDS2TJ472	4.7K 1/4
R421	ERDS2TJ913T	91K 1/4
R422	ERDS2TJ913T	91K 1/4
R423	ERDS2TJ124	120K 1/4
R424	ERDS2TJ124	120K 1/4
R425	ERDS2TJ101	100 1/4
R426	ERDS2TJ101	100 1/4
R427	ERDS2TJ223	22K 1/4
R429	ERDS2TJ472	4.7K 1/4
R431	ERDS2TJ472	4.7K 1/4
R432	ERDS2TJ101	100 1/4
R433	ERDS2TJ153	15K 1/4
R434	ERDS2TJ393	39K 1/4
R435	ERDS2TJ102	1K 1/4
R438	ERDS2TJ100	10 1/4
R440	ERDS2TJ102	1K 1/4
R442	ERDS2TJ102	1K 1/4
R443	ERDS2TJ102	1K 1/4
R601	ERDS2TJ104	100K 1/4
R602	ERDS2TJ472	4.7K 1/4
R603	ERDS2TJ472	4.7K 1/4
R604	ERDS2TJ472	4.7K 1/4
R605	ERDS2TJ472	4.7K 1/4
R606	ERDS2TJ472	4.7K 1/4
R607	ERDS2TJ472	4.7K 1/4
R617	ERDS2TJ103	10K 1/4
R801	ERDS2TJ103	10K 1/4
R802	ERDS2TJ103	10K 1/4
R803	ERDS2TJ103	10K 1/4
R804	ERDS2TJ103	10K 1/4
R805	ERDS2TJ223	22K 1/4
R806	ERDS2TJ223	22K 1/4
R807	ERDS2TJ223	22K 1/4
R808	ERDS2TJ223	22K 1/4
R809	ERDS2TJ473	47K 1/4
R810	ERDS2TJ473	47K 1/4
R811	ERDS2TJ473	47K 1/4
R812	ERDS2TJ473	47K 1/4
R813	ERDS2TJ221	220 1/4
R814	ERDS2TJ221	220 1/4
R815	ERDS2TJ474	470K 1/4
R816	ERDS2TJ474	470K 1/4
R817	ERDS2TJ104	100K 1/4
R818	ERDS2TJ104	100K 1/4
R819	ERDS2TJ681	680 1/4
R820	ERDS2TJ681	680 1/4
R821	ERDS2TJ473	47K 1/4
R822	ERDS2TJ473	47K 1/4
R823	ERDS2TJ331	330 1/4
R825	ERDS2TJ273	27K 1/4
R826	ERDS2TJ273	27K 1/4
R827	ERDS2TJ223	22K 1/4
R828	ERDS2TJ223	22K 1/4
R829	ERDS2TJ124	120K 1/4
R830	ERDS2TJ124	120K 1/4
R831	ERDS2TJ472	4.7K 1/4
R833	ERDS2TJ102	1K 1/4
R834	ERDS2TJ102	1K 1/4
R835	ERDS2TJ124	120K 1/4
R836	ERDS2TJ124	120K 1/4
R837	ERDS2TJ560	56 1/4
R838	ERDS2TJ560	56 1/4
R839	ERDS2TJ561	560 1/4
R840	ERDS2TJ561	560 1/4
R841	ERDS2TJ105	1M 1/4
R842	ERDS2TJ105	1M 1/4
R843	ERDS2TJ331	330 1/4
R850	ERDS2TJ822	8.2K 1/4
R851	ERDS2TJ102	1K 1/4
R852	ERDS2TJ102	1K 1/4
R853	ERDS2TJ333	33K 1/4
R854	ERDS2TJ183	18K 1/4
R855	ERDS2TJ102	1K 1/4

Ref. No.	Part No.	Value.
R856	ERDS2TJ102	1K 1/4
R857	ERDS2TJ102	1K 1/4
R858	ERDS2TJ102	1K 1/4
R862	ERDS2TJ102	1K 1/4
CAPACITORS(VALUE,VOLTAGE)		
C1 ⚠	ECKDKC103PF2	0.01 125
C10	ECEA1CU222	2200 16
C11	ECEA1CU222	2200 16
C13	ECEA1AU101	100 10
C14	ECEA1AU101	100 10
C15	ECEA0JU470	47 6.3
C16	ECEA1HU470	47 50
C17	ECEA1VU101	100 35
C19	ECBT1C103NS5	0.01 16
C20	ECEA1CU221	220 16
C30	ECBT1H102KB5	0.001 50
C31	ECBT1C103NS5	0.01 16
C32	ECBT1C103NS5	0.01 16
C301	ECFR1E104ZF5	0.1 25
C302	ECBT1C103NS5	0.01 16
C303	ECFR1E104ZF5	0.1 25
C306	ECEA0JS331	330 6.3
C307	ECFR1E104ZF5	0.1 25
C308	ECFR1E104ZF5	0.1 25
C309	ECBT1C103NS5	0.01 16
C351	ECBT1H102KB5	0.001 50
C401	ECEA0JU470	47 6.3
C402	ECFR1E104ZF5	0.1 25
C403	ECFR1E104ZF5	0.1 25
C404	ECFR1E104ZF5	0.1 25
C405	ECBT1H102KB5	0.001 50
C406	ECBT1H102KB5	0.001 50
C407	ECEA1HN010S	1 50
C409	ECBT1H102KB5	0.001 50
C414	ECBT1C103NS5	0.01 16
C416	ECBT1C103NS5	0.01 16
C420	ECBT1C103NS5	0.01 16
C421	ECBT1C103NS5	0.01 16
C422	ECBT1C103NS5	0.01 16
C601	RCBC1H101KBY	100P 50
C602	RCBC1H101KBY	100P 50
C603	RCBC1H101KBY	100P 50
C604	RCBC1H101KBY	100P 50
C801	ECBT1H680K5	68P 50
C802	ECBT1H680K5	68P 50
C803	ECBT1H680K5	68P 50
C804	ECBT1H680K5	68P 50
C805	ECBT1H470J5	47P 50
C806	ECBT1H470J5	47P 50
C807	ECBT1H470J5	47P 50
C808	ECBT1H470J5	47P 50
C809	ECEA1EN3R3S	3.3 25
C810	ECEA1EN3R3S	3.3 25
C811	ECBT1H102KB5	0.001 50
C812	ECBT1H102KB5	0.001 50
C813	ECEA1CN220S	22 16
C814	ECEA1CN220S	22 16
C815	ECBT1H102KB5	0.001 50
C816	ECBT1H102KB5	0.001 50
C817	ECEA1HN010S	1 50
C818	ECEA1HN010S	1 50
C819	ECBT1H470J5	47P 50
C820	ECBT1H470J5	47P 50
C822	ECBT1H5R6K5	5.6P 50
C824	ECBT1H5R6K5	5.6P 50
C840	ECFR1E104ZF5	0.1 25
C841	ECEA0JS331	330 6.3
C851	ECEA0JU471	470 6.3
C852	ECEA0JS331	330 6.3
C853	ECEA1CN100S	10 16
C854	ECFR1E104ZF5	0.1 25
C855	ECFR1E104ZF5	0.1 25
C856	ECFR1E104ZF5	0.1 25
C857	ECFR1E104ZF5	0.1 25
C858	ECFR1E104ZF5	0.1 25
C859	ECEA0JS331	330 6.3
C863	ECEA1HU3R3	3.3 50
C901	ECFTD103KXL	0.01 25
C902	ECFTD103KXL	0.01 25
C903	ECFTD103KXL	0.01 25
C904	ECCD1H680KC	68P 50
SERVO P.C.B.		
RESISTORS(VALUE,WATTAGE)		
R101	ERDS2TJ471	470 1/4
R102	ERJ6GEYJ120V	12 1/10
R103	ERJ6GEYJ122	1.2K 1/10
R104	ERJ6GEYJ471V	470 1/10
R105	RRJ6GCJ102TE	1K 1/6
R106	RRJ6GCJ102TE	1K 1/6
R108	ERJ6GEYJ224V	220K 1/10
R110	ERDS2TJ222	2.2K 1/4
R111	ERJ6GEYJ154V	150K 1/10
R113	ERJ6GEYJ472V	4.7K 1/10
R114	ERJ6GEYJ683V	68K 1/10
R116	ERJ6GEYJ332V	3.3K 1/10
R117	ERJ6GEYJ123	12K 1/10
R118	ERJ6GEYJ333V	33K 1/10
R119	RRJ6GCJ223TE	22K 1/6
R122	ERDS2TJ104	100K 1/4
R123	ERJ6GEYJ470V	47 1/10
R124	RRJ6GCJ103TE	10K 1/6
R125	RRJ6GCJ222TE	2.2K 1/6
R127	ERDS2TJ681	680 1/4
R128	RRJ6GCJ103TE	10K 1/6
CAPACITORS(VALUE,VOLTAGE)		
C101	ECEA1CKS220I	22 16
C102	ECEA1HKS010I	1 50
C103	ECEA1CKS220I	22 16
C106	RCUV1E104ZF	0.1 25
C107	ECEA0GKS101I	100 4
C108	ECEA0JKS470I	47 6.3
C109	ECEA1HKS010I	1 50
C110	RCUV1H681KB	680P 50
C111	ECUV1C224KR	0.22 16
C112	RCUV1H331KB	330P 50
C113	ECEA1HSN010I	1 50
C114	RCUV1E333KB	0.033 25
C115	ECEA1HSN010I	1 50
C116	RCUV1E333KB	0.033 25
C117	ECBT1H102KB5	0.001 50
C119	ECEA1CKN4R7I	4.7 16
C120	ECEA1CKN4R7I	4.7 16
C122	ECEA0JKS220I	22 6.3
C123	RCUV1E104ZF	0.1 25
C124	ECUV1E823KB	0.082 25
C125	ECUV1C224KR	0.22 16
C127	ECEA0JKF101I	100 6.3
C128	ECEA1CKA101I	100 16
C132	ECUV1E104KB	0.1 25
C133	RCUV1H330KC	33P 50
C134	ECUV1C224KR	0.22 16
C135	ECUV1C224KR	0.22 16
C136	ECEA0GKS101I	100 4
C138	RCUV1E104ZF	0.1 25
C139	RCUV1H470KC	47P 50
C140	RCUV1E103KB	0.01 25
C141	RCUV1H470KC	47P 50
C142	RCUV1H470KC	47P 50
C143	RCUV1H470KC	47P 50
C144	RCUV1H470KC	47P 50
C145	ECEA0JKF101I	100 6.3
C146	RCUV1H181KC	180P 50
C147	RCUV1H472KB	0.0047 50
C148	ECEA1ESN4R7I	4.7 25
C149	RCUV1E104ZF	0.1 25
C150	RCUV1E103KB	0.01 25

■ REPLACEME

Notes : * Important safety noti
Components identifie
manufacturer's spec
* Bracketed indication
Parts without these i

Ref. No.	Part No.
INTEGRATED CIRCUITS	
IC11	LM2940T5
IC13	SVIBA4558F
IC301	MN6622
IC302	SVICXK5816M
IC401	MN1554PEW
IC402	SVIBA4558F
IC601	MN15283PEM
IC602	HC-MD10E
IC801	MN6623A
IC802	AN6558S
IC803	LM833M
IC804	NJM4560M
IC805	SVIH8DN2175
IC806	SVIH8DN2175
IC809	SVIT0TX172
TRANSISTORS	
Q11	2SB1240-P
Q12	2SB1240-P
Q13	2SA1547-Q
Q14	2SD1862-P
Q15	2SB1240-P
Q16	2SD1862-P
Q301	DTC124EST
Q351	DTA124EST
Q401	2SD1862-P
Q402	2SB1240-P
Q403	2SD1862-P
Q404	2SB1240-P
Q405	DTC124EST
Q406	DTC124EST
Q407	DTC124EST
Q601	DTC124EST
Q602	DTC124EST
Q603	DTC124EST
Q604	DTC124EST
Q605	DTC124EST
Q606	DTC124EST
Q607	DTC124EST
Q608	DTC124EST
Q609	DTC124EST
Q610	DTC124EST
Q611	DTC124EST
Q612	DTC124EST
Q801	2SC3311A-Q
Q802	2SC3311A-Q
Q803	2SD1450RST
Q804	2SD1450RST
Q805	2SD1450RST
Q806	2SD1450RST
Q851	DTA124EST
Q852	DTC124EST
Q853	DTA114EST
Q854	DTC124EST
Q855	DTA124EST
Q856	DTA124EST
DIODES	
D11 ⚠	SVD1SR35200A
D12 ⚠	SVD1SR35200A
D13 ⚠	SVD1SR35200A
D14 ⚠	SVD1SR35200A
D15 ⚠	SVD1SR35200A
D16	MA4300MHTA
D17 ⚠	SVD1SR35200A
D19	MA4062-H
D23	MA4056-M
D24	MA4150MHTA
D25	MA4150MHTA
D410	MA4033M
D411	SVD1SS254

Value.	
33K	1/10
22K	1/6
100K	1/4
47	1/10
10K	1/6
2.2K	1/6
680	1/4
10K	1/6
22	16
1	50
22	16
0.1	25
100	4
47	6.3
1	50
680P	50
0.22	16
330P	50
1	50
0.033	25
1	50
0.033	25
0.001	50
4.7	16
4.7	16
22	6.3
0.1	25
0.082	25
0.22	16
100	6.3
100	16
0.1	25
33P	50
0.22	16
0.22	16
100	4
0.1	25
47P	50
0.01	25
47P	50
47P	50
47P	50
47P	50
100	6.3
180P	50
0.0047	50
4.7	25
0.1	25
0.01	25

■ REPLACEMENT PARTS LIST (Electrical parts)

Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC11	LM2940T5	I.C. REGULATOR
IC13	SVIBA4558F	I.C. REGULATOR
IC301	MN6622	I.C. SIGNAL PROCESSING
IC302	SVICXK5816M	I.C. 16K RAM
IC401	MN1554PEW	I.C. SYSTEM CONTROL
IC402	SVIBA4558F	I.C. REGULATOR
IC601	MN15283PEM	I.C. FL DRIVE
IC602	HC-MD10E	I.C. REMOTE SENSOR
IC801	MN6623A	I.C. DF & DAC
IC802	AN6558S	I.C. BUFFER AMP
IC803	LM833M	I.C. OPERATION AMP
IC804	NJM4560M	I.C. OPERATION AMP.
IC805	SVIH8DN2175	I.C. LPF
IC806	SVIH8DN2175	I.C. LPF
IC809	SVITOTX172	I.C. OP MODULE
TRANSISTORS		
Q11	2SB1240-P	TRANSISTOR
Q12	2SB1240-P	TRANSISTOR
Q13	2SA1547-Q	TRANSISTOR
Q14	2SD1862-P	TRANSISTOR
Q15	2SB1240-P	TRANSISTOR
Q16	2SD1862-P	TRANSISTOR
Q301	DTC124EST	TRANSISTOR
Q351	DTA124EST	TRANSISTOR
Q401	2SD1862-P	TRANSISTOR
Q402	2SB1240-P	TRANSISTOR
Q403	2SD1862-P	TRANSISTOR
Q404	2SB1240-P	TRANSISTOR
Q405	DTC124EST	TRANSISTOR
Q406	DTC124EST	TRANSISTOR
Q407	DTC124EST	TRANSISTOR
Q601	DTC124EST	TRANSISTOR
Q602	DTC124EST	TRANSISTOR
Q603	DTC124EST	TRANSISTOR
Q604	DTC124EST	TRANSISTOR
Q605	DTC124EST	TRANSISTOR
Q606	DTC124EST	TRANSISTOR
Q607	DTC124EST	TRANSISTOR
Q608	DTC124EST	TRANSISTOR
Q609	DTC124EST	TRANSISTOR
Q610	DTC124EST	TRANSISTOR
Q611	DTC124EST	TRANSISTOR
Q612	DTC124EST	TRANSISTOR
Q801	2SC3311A-Q	TRANSISTOR
Q802	2SC3311A-Q	TRANSISTOR
Q803	2SD1450RST	TRANSISTOR
Q804	2SD1450RST	TRANSISTOR
Q805	2SD1450RST	TRANSISTOR
Q806	2SD1450RST	TRANSISTOR
Q851	DTA124EST	TRANSISTOR
Q852	DTC124EST	TRANSISTOR
Q853	DTA114EST	TRANSISTOR
Q854	DTC124EST	TRANSISTOR
Q855	DTA124EST	TRANSISTOR
Q856	DTA124EST	TRANSISTOR
DIODES		
D11 ⚠	SVD1SR35200A	DIODE
D12 ⚠	SVD1SR35200A	DIODE
D13 ⚠	SVD1SR35200A	DIODE
D14 ⚠	SVD1SR35200A	DIODE
D15 ⚠	SVD1SR35200A	DIODE
D16	MA4300MHTA	DIODE
D17 ⚠	SVD1SR35200A	DIODE
D19	MA4062-H	DIODE
D23	MA4056-M	DIODE
D24	MA4150MHTA	DIODE
D25	MA4150MHTA	DIODE
D410	MA4033M	DIODE
D411	SVD1SS254	DIODE

Ref. No.	Part No.	Description
D601	SVD1SS254	DIODE
D602	SVD1SS254	DIODE
D603	SVD1SS254	DIODE
D604	SVD1SS254	DIODE
D605	SVD1SS254	DIODE
D851	SVD1SS254	DIODE
D852	SVD1SS254	DIODE
D853	SVD1SS254	DIODE
D854	SVD1SS254	DIODE
D855	SVD1SS254	DIODE
D856	SVD1SS254	DIODE
D857	SVD1SS254	DIODE
I.C.PROTECTORS		
ICP11 ⚠ (EK)	SRUN15	I.C. PROTECTOR
ICP12 ⚠ (EK)	SRUN15	I.C. PROTECTOR
COILS AND TRANSFORMERS		
L1 (E, EG, EB, EH) (EF, EI)	SLQX400-D	COIL
L2 (E, EG, EB, EH) (EF, EI)	SLQX400-D	COIL
L404	ELEY3R3KA	COIL
L901	ELEY3R3KA	COIL
L902	ELEY3R3KA	COIL
L903	ELEY3R3KA	COIL
T1 ⚠ (E, EG, EB, EH) (EF, EI)	SLTD5V081E	POWER TRANSFORMER
T1 ⚠ (EK, XL)	SLTD5V082G	POWER TRANSFORMER
T1 ⚠ (XA, XB, PC)	SLTD5V083X	POWER TRANSFORMER
OSCILLATORS		
X801	SVQ49U338S	OSCILLATOR
DISPLAYS		
FL601	SADFV266G	DISPLAY TUBE
FUSES		
F1 ⚠ (E, EG, EB, EH) (EF, EI, EK) (XL)	XBA2C012TB0S	FUSE(250V, T125mA)
F1 ⚠ (XB, XA, PC)	XBA2C025TB0	FUSE, 250V, T250mA
F2 ⚠ (E, EG, EB, EH) (EF, EI)	XBA2C08TB0	FUSE 250V, T800MA
SWITCHES		
S1 ⚠	ESB8249V	SW, POWER
S2 ⚠ (XA, PC, XB)	SSR187-1	SW, VOLTAGE SELECTOR
S101	SSPD17	SW, LOADING DET.
S102	SSPD18	SW, LOADING DET.
S601	EVQQS405K	SW, CH1
S602	EVQQS405K	SW, CH2
S603	EVQQS405K	SW, CH3
S604	EVQQS405K	SW, CH4
S605	EVQQS405K	SW, CH5
S606	EVQQS405K	SW, CH6
S607	EVQQS405K	SW, CH7
S608	EVQQS405K	SW, CH8
S609	EVQQS405K	SW, CH9
S610	EVQQS405K	SW, CH10
S611	EVQQS405K	SW, PROGRAM
S612	EVQQS405K	SW, CANCELL
S613	EVQQS405K	SW, TIME
S614	EVQQS405K	SW, REPEAT
S615	EVQQS405K	SW, RECALL
S616	EVQQS405K	SW, SKIP(FOR)
S617	EVQQS405K	SW, SKIP(BACK)
S618	EVQQS405K	SW, +10
S619	EVQQS405K	SW(0)
S620	EVQQS405K	SW, A/B
S621	EVQQS405K	SW, EDIT
S622	EVQQS405K	SW, OPEN/CLOSE
S623	EVQQS405K	SW, STOP/CLEAR
S624	EVQQS405K	SW, PAUSE
S625	EVQQS405K	SW, PLAY
S626	EVQQS405K	SW, SCAN
S627	EVQQS405K	SW, WARP
S628	EVQQS405K	SW, LINK
S651	SSS148	SLIDE SWITCH, TIMER PLAY
SERVO P.C.B.		

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101	AN8373S	I.C. SERVO AMP
IC102	AN8374S	I.C. SERVO PROCESSOR
IC103	AN8377	I.C. B.T.L DRIVE
IC104	LM2940T5M	I.C. RESET
TRANSISTORS		
Q101	2SA1547QSTV2	TRANSISTOR
VARIABLE RESISTORS		
VR101	EVND3AA00B14	V.R. BEST EYE ADJ.
VR102	EVND3AA00B14	V.R. TRACKING GAIN ADJ.
VR103	EVND3AA00B14	V.R. TRACKING OFFSET ADJ.
VR104	EVND3AA00B14	V.R. FOCUS GAIN ADJ.
VR105	EVND3AA00B14	V.R. FOCUS OFFSET ADJ.
VR106	EVND3AA00B24	V.R. TRACKING BALANCE ADJ.
MAGNET RESISTOR ELEMENTS		
RA1	EWS7M0A00Q53	RESISTANCE UNIT

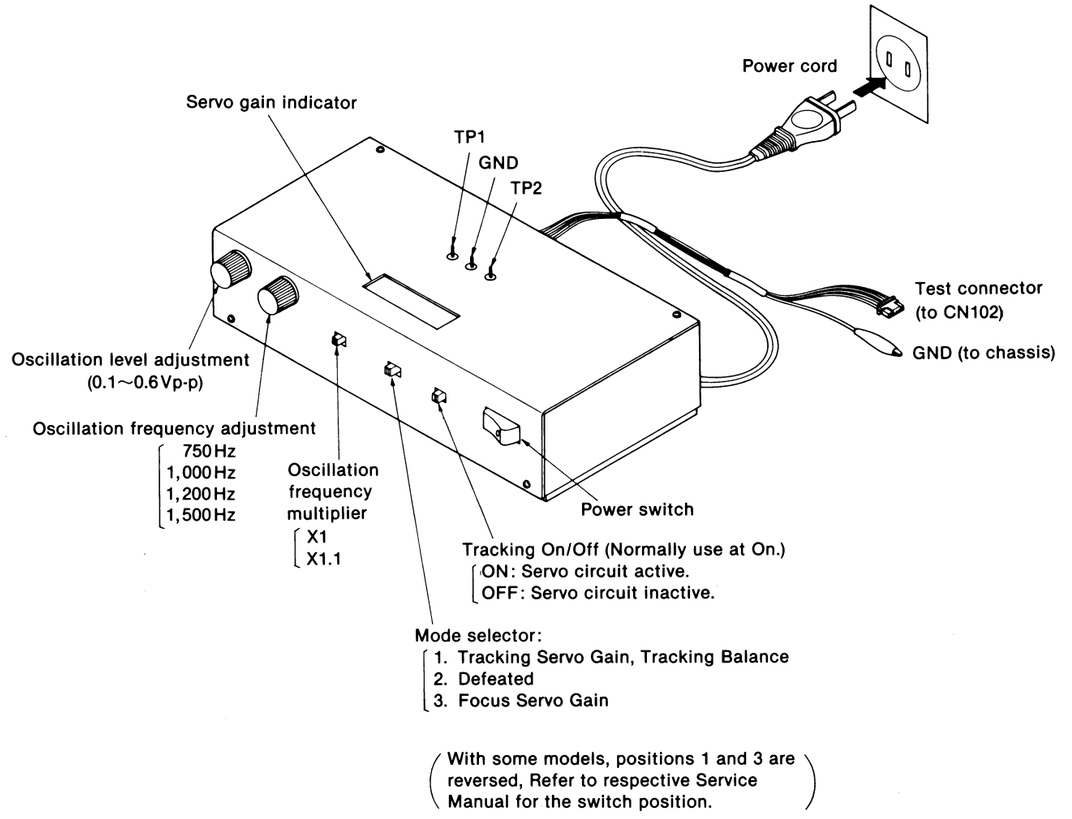
■ NEW SERVO GAIN ADJUSTER (Servo Amp. Adjusting Fixture)

The following introduces the improved version of the current servo gain adjuster (SZZP1017F):

Part number: SZZP1094C

Features:

(1) Contains all oscillation frequencies and output adjustments needed for focus servo gain, tracking servo gain, and tracking balance adjustment (requires no external oscillator).
(2) Panel indicators indicate the best points of focus and tracking servo gains (no oscilloscope needed).
(3) Internal power supply eliminates the need for power supply from the CD player.



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